
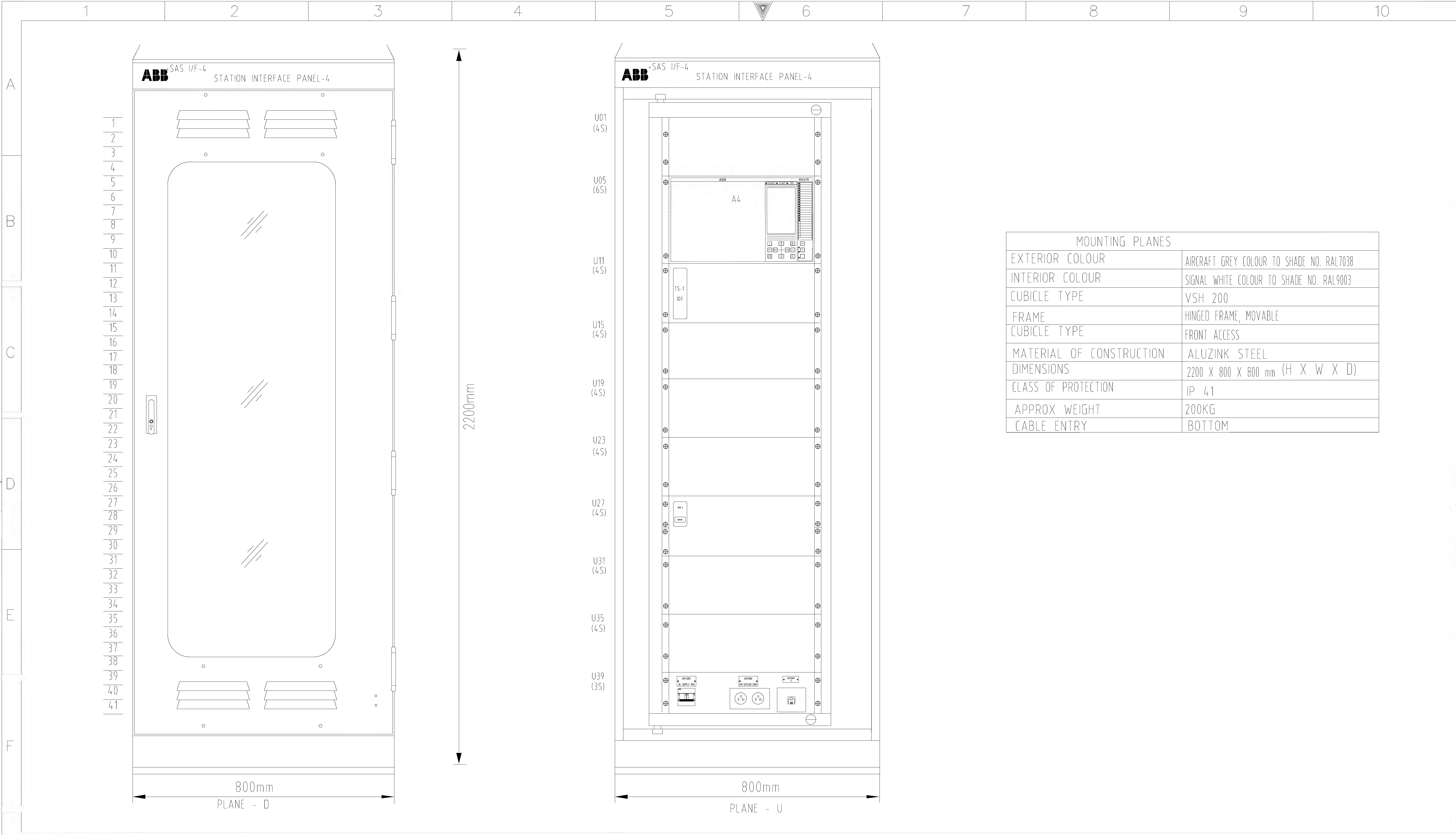


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B							
C	<div><div>CONTRACTOR</div><div>:</div><div>ABB Contracting Company</div></div>						
D	<div><div>CLIENT</div><div>:</div><div>National Grid sa</div></div>						
E	<div><div>PROJECT</div><div>:</div><div>CONSTRUCTION OF NEW 132/13.8kV SS 8709 I</div></div>						
F	<div><div>SUBSTATION</div><div>:</div><div>S/S 8709</div></div>						
	<div><div>CONTRACT NO.</div><div>:</div><div>11131113/00</div></div>						
	<div><div>TITLE</div><div>:</div><div>Assembly Drawing - +SAS I/F-4</div></div>						
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET
	01	13 48	AS MANUFACTURED		DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4
	00	13 20	FOR APPROVAL		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709 S-13656
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC _____		RIYADH SAUDI ARABIA



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

01	13 48	AS MANUFACTURED
00	13 20	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY NSK CHECKED BY JKR
DATE STARTED 15.3.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING

SAS INTERFACE PANEL +SAS I/F-4

S/S 8709

S-13656

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



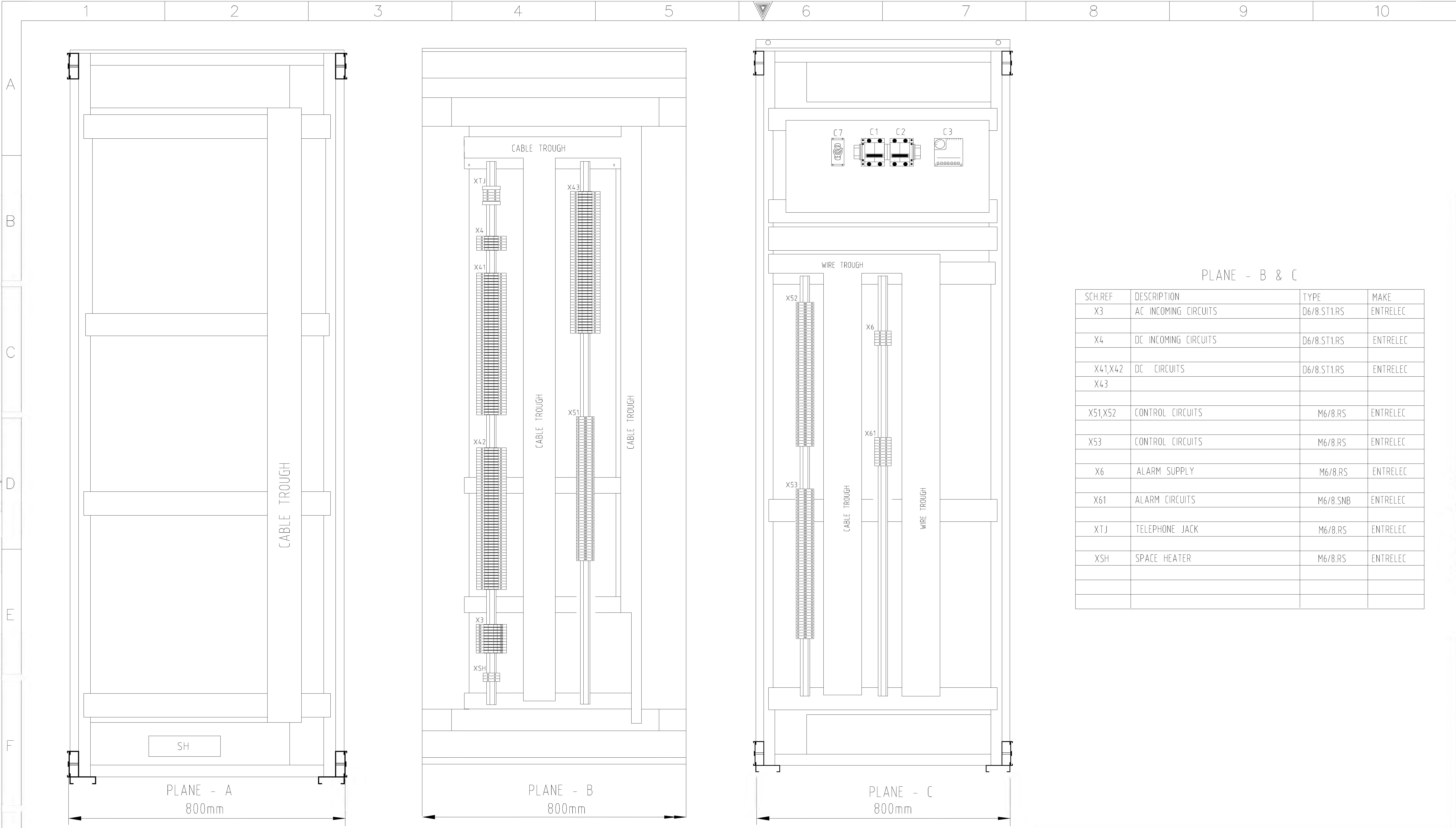
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			G01	G02	

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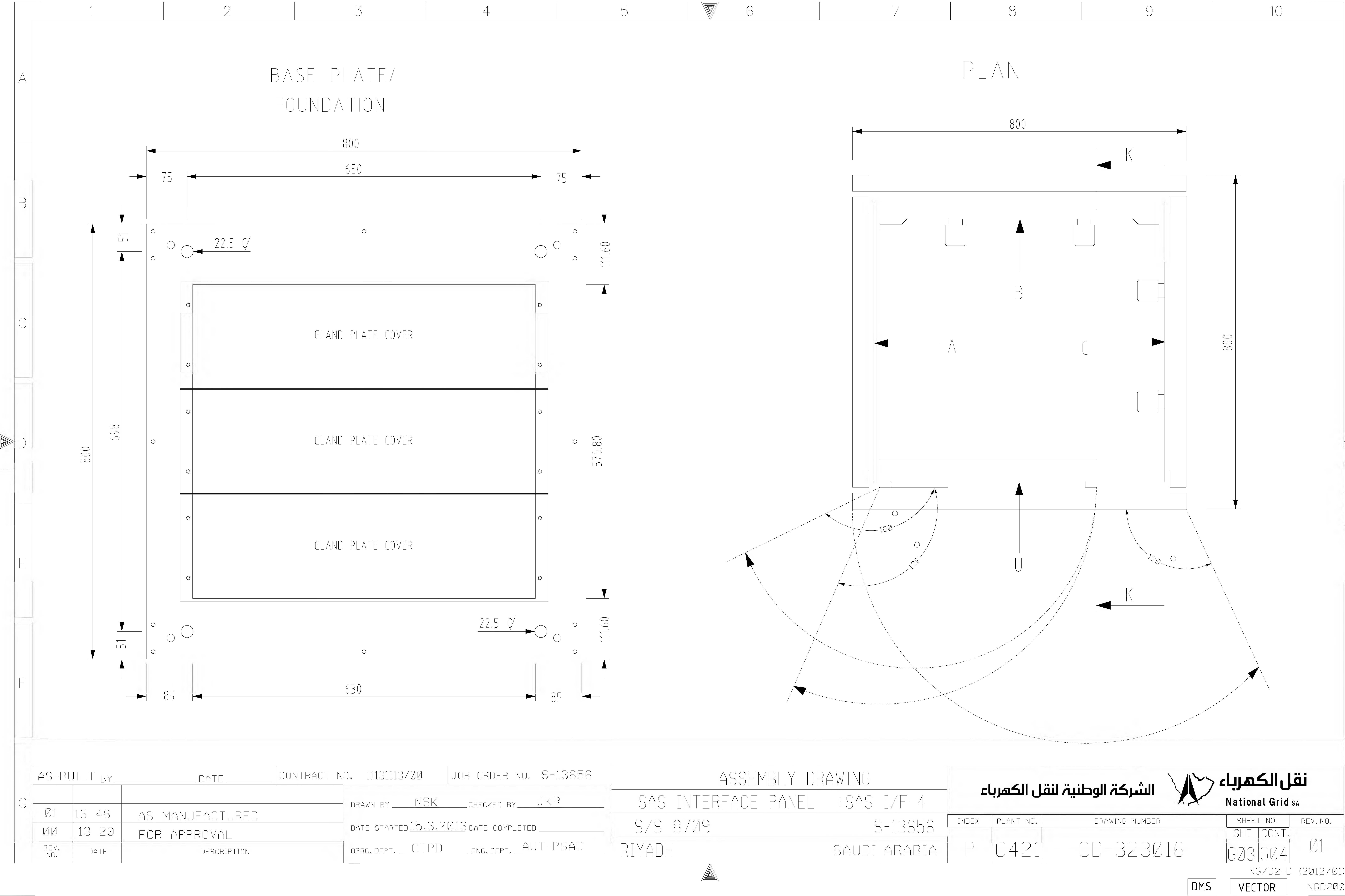
NGD200



PLANE - B & C


SCH.REF	DESCRIPTION	TYPE	MAKE
X3	AC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X4	DC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X41,X42 X43	DC CIRCUITS	D6/8.ST1.RS	ENTRELEC
X51,X52	CONTROL CIRCUITS	M6/8.RS	ENTRELEC
X53	CONTROL CIRCUITS	M6/8.RS	ENTRELEC
X6	ALARM SUPPLY	M6/8.RS	ENTRELEC
X61	ALARM CIRCUITS	M6/8.SNB	ENTRELEC
XTJ	TELEPHONE JACK	M6/8.RS	ENTRELEC
XSH	SPACE HEATER	M6/8.RS	ENTRELEC

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		ASSEMBLY DRAWING			
			DRAWN BY _____ NSK _____		CHECKED BY _____ JKR _____		SAS INTERFACE PANEL +SAS I/F-4			
01 13 48			AS MANUFACTURED		DATE STARTED 15.3.2013		DATE COMPLETED _____		S/S 8709 S-13656	
00 13 20			FOR APPROVAL		OPRG. DEPT. _____ CTPD _____		ENG. DEPT. _____ AUT-PSAC _____		RIYADH SAUDI ARABIA	
REV. NO.			DATE		DESCRIPTION		INDEX		PLANT NO.	
							P		C421	
									DRAWING NUMBER	
									CD-323016	
									SHEET NO.	
									SHT CONT.	
									G02 G03	
									REV. NO.	
									01	



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F	TITLE : LIST OF APPARATUS +SAS I/F-4																																																																					
G	<table><tr><td colspan="3">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="3">COVER SHEET</td></tr><tr><td colspan="3"></td><td colspan="2">DRAWN BY NSK</td><td colspan="2">CHECKED BY JKR</td><td colspan="3">SAS INTERFACE PANEL +SAS I/F-4</td></tr><tr><td colspan="3">01 13 48 AS MANUFACTURED</td><td colspan="2">DATE STARTED 15.3.2013</td><td colspan="2">DATE COMPLETED _____</td><td colspan="3">S/S 8709 S-13656</td></tr><tr><td colspan="3">00 13 20 FOR APPROVAL</td><td colspan="2">OPRG. DEPT. CTPD</td><td colspan="2">ENG. DEPT. AUT-PSAC</td><td colspan="3">RIYADH SAUDI ARABIA</td></tr><tr><td>REV. NO.</td><td>DATE</td><td>DESCRIPTION</td><td colspan="7"><table><tr><td>INDEX</td><td>PLANT NO.</td><td>DRAWING NUMBER</td><td>SHEET NO.</td><td>REV. NO.</td></tr><tr><td>P</td><td>C421</td><td>CD-323016</td><td>L00L01</td><td>01</td></tr></table></td></tr></table>										AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET						DRAWN BY NSK		CHECKED BY JKR		SAS INTERFACE PANEL +SAS I/F-4			01 13 48 AS MANUFACTURED			DATE STARTED 15.3.2013		DATE COMPLETED _____		S/S 8709 S-13656			00 13 20 FOR APPROVAL			OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA			REV. NO.	DATE	DESCRIPTION	<table><tr><td>INDEX</td><td>PLANT NO.</td><td>DRAWING NUMBER</td><td>SHEET NO.</td><td>REV. NO.</td></tr><tr><td>P</td><td>C421</td><td>CD-323016</td><td>L00L01</td><td>01</td></tr></table>							INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.	P	C421	CD-323016	L00L01	01
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A										
B	SR. NO.	GA REF.	SCH. REF.	D E S C R I P T I O N	SHEET NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION	COUNTRY OF ORIGIN
				STATION INTERFACE PANEL-4						
	1	U05.5001	A4	STATION COMMON ALARM SWITCHING EQUIPMENT WITH FOLLOWING SPECIFICATION	291 TO 296	1	REC 670	ABB	1MRK 002814-AC	SWEDEN
				AUX : EL=90-250V DC FREQ : 50/60HZ BINARY INPUT : 14 NOS(PER CARD 16 INPUTS RL=110-125DC)						
C	2	U11.101	TS-1	TEST SWITCH FOR REC 670 (A4)	245	1	RTXP18	ABB	RK 926 115-AN	SWEDEN
	3	U27.101	74IF	DUAL TARGET RELAY (REVERSE FLAG) (A1 DC FAIL/SPARE) CONTACTS :1NO+2NC PER COIL AUX.VOLT :1NO+2NC PER COIL FLAG :SELF RESET	245	1	RXSF1	ABB	RK 271 019 AN	SWEDEN
D	4			MCB 2 POLE 6A, FOR DC SUPPLY WITH 2NC AUXILIARY CONTACT	216	1	S 282 UC-K6 S2-H02	ABB	GH S282 0164 R0377 GH S270 1916 R0003	GERMANY
		U39.5001	Q1	Q1 IF+ SUPPLY						FRANCE
	5	U39.5002	C01 C02	CONVENIENCE OUTLET 10A, 127V AC CONVENIENCE OUTLET 10A, 220V AC	211	1	USM45 & USMS45	LEGRAND	74140 & 74180	
			C1,C2	MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS	211	2	S202P-K10 S2C-H11L	ABB	2CDS 253 001 R0104 2CDS 200 936 R0001	GERMANY
	6		C3	THERMOSTAT FOR SPACE HEATER, 5-60 C	211	1	SK 3110	RITTAL	SK 3110	THIWAN
	7	U39.5003	TJ	TELEPHONE JACK 1GANG 4WIRE	211	1	EDF410	EDISON	EDF410	SWEDEN
	8		C7	ON/OFF SWITCH FOR SPACE HEATER	211	1	M2SS1-10B MCBH-10	ABB	1SFA 611 200 R1006 1SFA 611 605 R1101	
	9		DS	DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUMINATION LAMP	211	1	LS30P	ABB	1SBV 010213 R1202	SWEDEN
	10		TL	INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V AC, 60Hz SUPPLY, 20W	211	1	T-4	SUNON	SP-20W	
	11		SH	SPACE HEATER, 150W, 120V, 60Hz	211	1	MICA	GRUPPO	1FZEK 006 C001	ITALY
E										
F										
G										

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

LIST OF APPARATUS

SAS INTERFACE PANEL +SAS I/F-4

S/S 8709 S-13656

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

 نقل الكهرباء
National Grid sa

REV. NO. DATE DESCRIPTION

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

DRAWN BY NSK CHECKED BY JKR

DATE STARTED 15.3.2013 DATE COMPLETED _____

INDEX P

PLANT NO. C421

DRAWING NUMBER CD-323016

SHEET NO. SHT L01 CONT. L02

REV. NO. 01

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LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE
U05.5001	U05.5001 A4	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm
U11.101	U11.101 TS-1	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm
U27.101	U27.101 74IF/SPARE	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm

LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE
C1	C1 127V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C2	C2 220V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C3	C3 THERMOSTAT	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C7	C7 ON/OFF SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
DS	DS DOOR SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
IL	IL ILLUMINATION LAMP	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
SH	SH SPACE HEATER	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm

G

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS		<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>					
01	13 48	AS MANUFACTURED	DRAWN BY _____ NSK _____ CHECKED BY _____ JKR _____			SAS INTERFACE PANEL +SAS I/F-4			INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
00	13 20	FOR APPROVAL	DATE STARTED 15.3.2013 DATE COMPLETED _____			S/S 8709 S-13656			P	C421	CD-323016	SHT	CONT.	01
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC _____			RIYADH SAUDI ARABIA						L03	NIL	



	1	2	3	4	5	6	7	8	9	10																																																			
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AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		CONTENTS SHEET			
01 13 48 AS MANUFACTURED			DRAWN BY NSK CHECKED BY JKR		SAS INTERFACE PANEL +SAS I/F-4		S/S 8709 S-13656			
00 13 20 FOR APPROVAL			DATE STARTED 15.3.2013 DATE COMPLETED _____		RIYADH SAUDI ARABIA		INDEX P PLANT NO. C421 DRAWING NUMBER CD-323017			
REV. NO. DATE DESCRIPTION			OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC				SHEET NO. SHT CONT. 001 011 REV. NO. 01			

CONTENTS						ABB SHT.NO.	REV.00	REV.01	REV.02	REV.03
COVER SHEET						000	X	X		
CONTENTS SHEET						001	X	X		
GRAPHICAL SYMBOLS FOR DIAGRAMS						011	X	X		
GRAPHICAL SYMBOLS FOR DIAGRAMS						012	X	X		
COMMON LEGEND						013	X	X		
FERRULE AND WIRING DETAILS						014	X	X		
PRIMARY SYSTEM						051	X	X		
AC SUPPLY FOR ILLUMINATION & POWER SOCKET						211	X	X		
AUXLIARY CONTACTS						212	X	X		
DC SUPPLY DISTRIBUTION						216	X	X		
STATION INTERFACE PANEL BINARY INPUTS						231	X	X		
STATION INTERFACE PANEL BINARY INPUTS						232	X	X		
STATION INTERFACE PANEL BINARY INPUTS						233	X	X		
STATION INTERFACE PANEL BINARY INPUTS						234	X	X		
STATION INTERFACE PANEL BINARY INPUTS						235	X	X		
STATION INTERFACE PANEL BINARY INPUTS						236	X	X		
STATION INTERFACE PANEL BINARY INPUTS						237	X	X		
STATION INTERFACE PANEL BINARY INPUTS						238	X	X		
STATION INTERFACE PANEL BINARY INPUTS						239	X	X		
STATION INTERFACE PANEL BINARY INPUTS						240	X	X		
STATION INTERFACE PANEL BINARY INPUTS						241	X	X		

CONTENTS						ABB SHT.NO.	REV.00	REV.01	REV.02	REV.03
STATION INTERFACE PANEL BINARY INPUTS						242	X	X		
STATION INTERFACE PANEL BINARY INPUTS						243	X	X		
STATION INTERFACE PANEL BINARY INPUTS						244	X	X		
DC SUPERVISION CIRCUIT						245	X	X		
COMMON ALARM CIRCUITS						290	X	X		
BLOCK REFERENCE						291	X	X		
BLOCK REFERENCE						292	X	X		
BLOCK REFERENCE						293	X	X		
BLOCK REFERENCE						294	X	X		
BLOCK REFERENCE						295	X	X		
BLOCK REFERENCE						296	X	X		
TERMINAL BLOCK REFERENCE						301	X	X		
TERMINAL BLOCK REFERENCE						302	X	X		

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National Grid sa

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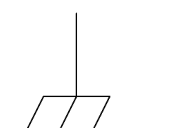
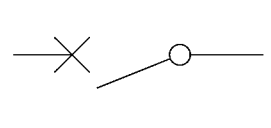
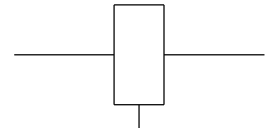
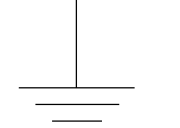
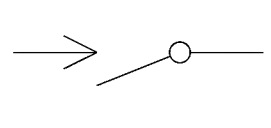
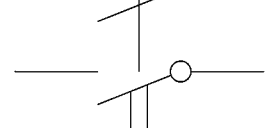
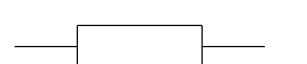
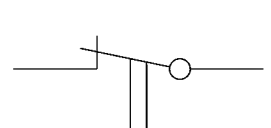
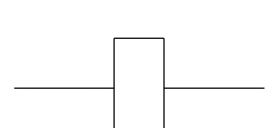
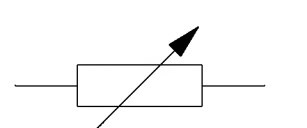
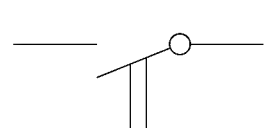
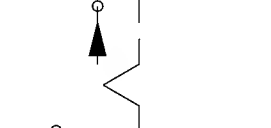
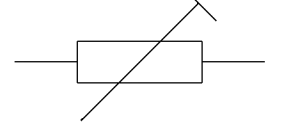

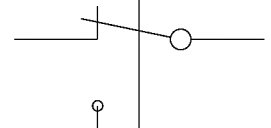


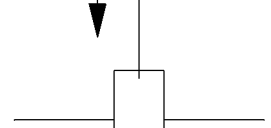
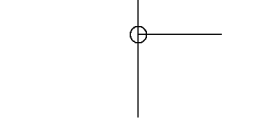
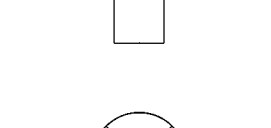
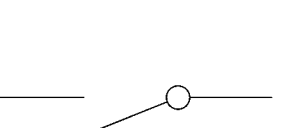
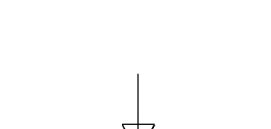
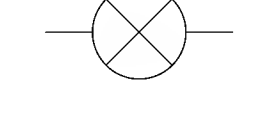
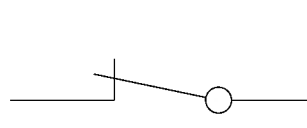
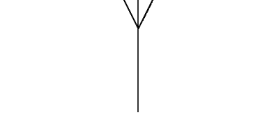
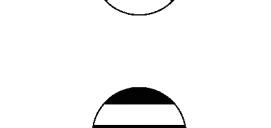
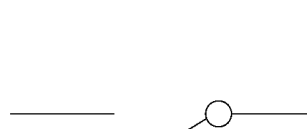


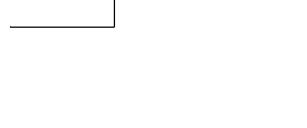
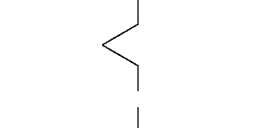
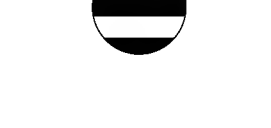
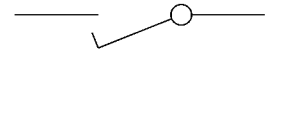
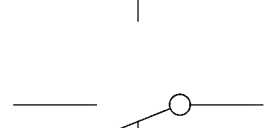
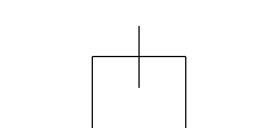
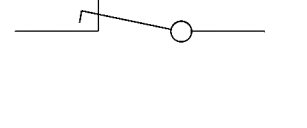
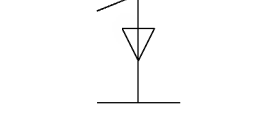
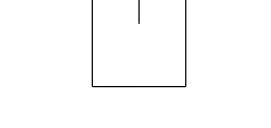
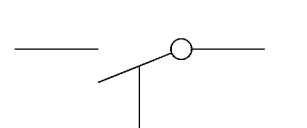
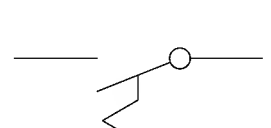
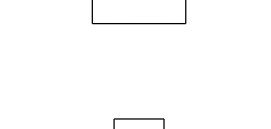
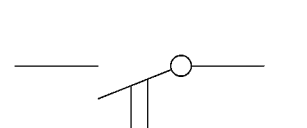
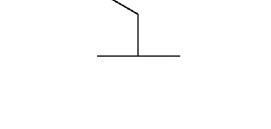
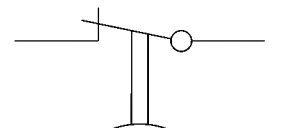
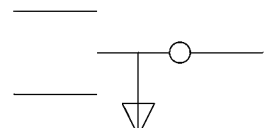
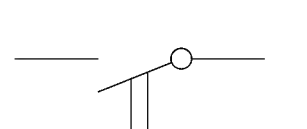
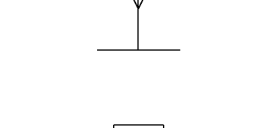
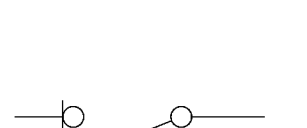
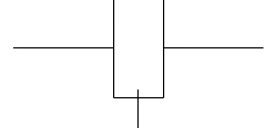
B

C

D

E

F

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FRAME CONNECTION		MAIN CONTACT OF A CIRCUIT BREAKER		RELAY WITH TWO MAKE CONTACTS, ONE OF THEM DELAYED WHEN OPERATING
	EARTH CONNECTION		PASSING MAKE CONTACT CLOSING MOMENTARILY DURING OPERATION AND RELEASE		RELAY WITH TWO ACTUATORS AND A TWO STABLE POSITIONS
	RESISTOR		BREAK CONTACT DELAYED WHEN OPERATING		
	VARIABLE RESISTOR		MAKE CONTACT DELAYED WHEN RELEASING		SIGNALLING LAMP
	RESISTOR WITH PRESET ADJUSTMENT		TWO MECHANICAL LINKS CROSSING WITHOUT CONNECTION		MECHANICAL INDICATOR WITH AUTOMATIC RESET
	CAPACITOR		JUNCTION OF MECHANICAL LINKS		MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	SEMICONDUCTOR DIODE USED AS A CAPACITIVE DEVICE		AUTOMATIC RESET		ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH AUTOMATIC RESET
	OPEN CONTACT, MAKE CONTACT		NON-AUTOMATIC RESET		ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	CLOSED CONTACT, BREAK CONTACT		SWITCHING DEVICE WITH MANUAL OPERATION AND WITH AUTOMATIC RESET		RELAY WITH MAKE CONTACT
	CHANGE-OVER CONTACT, BREAK BEFORE MAKE		SWITCHING DEVICE WITH MANUAL OPERATION AND WITH NON-AUTOMATIC RESET		RELAY WITH CHANGE-OVER CONTACT
	MAKE CONTACT WHICH IS EARLY WHEN OPERATING AND LATE WHEN RELEASING		CHANGE-OVER SWITCHING DEVICE WITH MANUAL CONTROL		RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING
	BREAK CONTACT WHICH IS LATE WHEN OPERATING AND EARLY WHEN RELEASING		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING
	SWITCHING DEVICE WITH MANUAL CONTROL		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		BELL, BUZZER
	MAKE CONTACT DELAYED WHEN OPERATING		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		SIREN , HORN
	BREAK CONTACT DELAYED WHEN RELEASING		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		
	MAKE CONTACT DELAYED WHEN OPERATING AND RELEASING		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		
	MAIN CONTACT OF A SWITCH DISCONNECTOR		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		
	MAIN CONTACT OF A DISCONNECTOR		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		

G

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		GRAPHICAL SYMBOLS FOR DIAGRAMS		<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>	
DRAWN BY _____ NSK _____ CHECKED BY _____ JKR			DATE STARTED 15.3.2013		DATE COMPLETED _____		SAS INTERFACE PANEL +SAS I/F-4			
01 13 48 AS MANUFACTURED			DATE STARTED 15.3.2013		DATE COMPLETED _____		S/S 8709		S-13656	
00 13 20 FOR APPROVAL			OPRG. DEPT. _____ CTPD _____		ENG. DEPT. _____ AUT-PSAC _____		RIYADH		SAUDI ARABIA	
REV. NO. _____ DATE _____ DESCRIPTION _____			OPRG. DEPT. _____ CTPD _____		ENG. DEPT. _____ AUT-PSAC _____		RIYADH		SAUDI ARABIA	

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
P	C421	CD-323017	SHT 011	CONT. 012
			011	012



	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										

LEGENDS

±R1	DC SUPPLY - MAIN PROTECTION
±R2	DC SUPPLY - SECONDARY PROTECTION
±R3	DC SUPPLY - BACK UP PROTECTION
±IT	DC SUPPLY - INTER TRIP
FL	DC SUPPLY - FLASHING CIRCUIT
BB RS±	DC SUPPLY - BUS BAR - PROTECTION RESET
BB CBF±/CBF±	DC SUPPLY - CBF PROTECTION
R	RESET BUS - ALARM SYSTEM
CR	CONTROL ROOM
ECC	ENERGY CONTROL CENTRE
LOCAL	THE LOCATION OF CONTROLLED DEVICE
REMOTE	ANY OTHER LOCATION NOT LOCAL
ON	CB NORMALLY OPEN AUXILIARY CONTACT
OFF	CB NORMALLY CLOSED AUXILIARY CONTACT
A	COMMON
T	TEST POSITION
S	SERVICE POSITION
CS	CLOSE IN SERVICE POSITION
CT	CLOSE IN TEST POSITION
LS	LOCAL SERVICE
LT	LOCAL TEST
LC	LOCAL CLOSE
LO	LOCAL OPEN
RO	REMOTE OPEN

NOTES

LABELS

WHITE LABEL WITH BLACK LETTERING WILL BE PROVIDED FOR ALL MOUNTED APPARATUS EQUIPMENT IDENTIFICATION AND FUNCTION REFERENCE LABEL WILL BE PROVIDED FOR FRONT MOUNTED EQUIPMENTS OF THE PANEL AND EQUIPMENT IDENTIFICATION LABEL WILL BE PROVIDED FOR INTERNALLY MOUNTED EQUIPMENTS

WIRING

PVC INSULATED 600V GRADE
2.5 SQ.mm. YELLOW COLOURED FOR CT CIRCUITS
2.5 SQ.mm. RE COLOURED FOR VT CIRCUITS
1.5 SQ.mm. GREY COLOURED FOR DC SUPPLY, SCADA AND CONTROL CIRCUITS
1.5 SQ.mm. BLUE COLOURED FOR COMMON ALARM SIGNALS
2.5 SQ.mm. BLACK COLOURED FOR AVC AND AC CIRCUITS
2.5 SQ.mm. YELLOW/GREEN COLOURED FOR EARTHING CONNECTIONS
FOLLOWING MARKERS SHALL BE PROVIDED ON FOLLOWING WIRES:
+ SIGN FOR DC + WIRE
- SIGN FOR DC - WIRE

LUGS

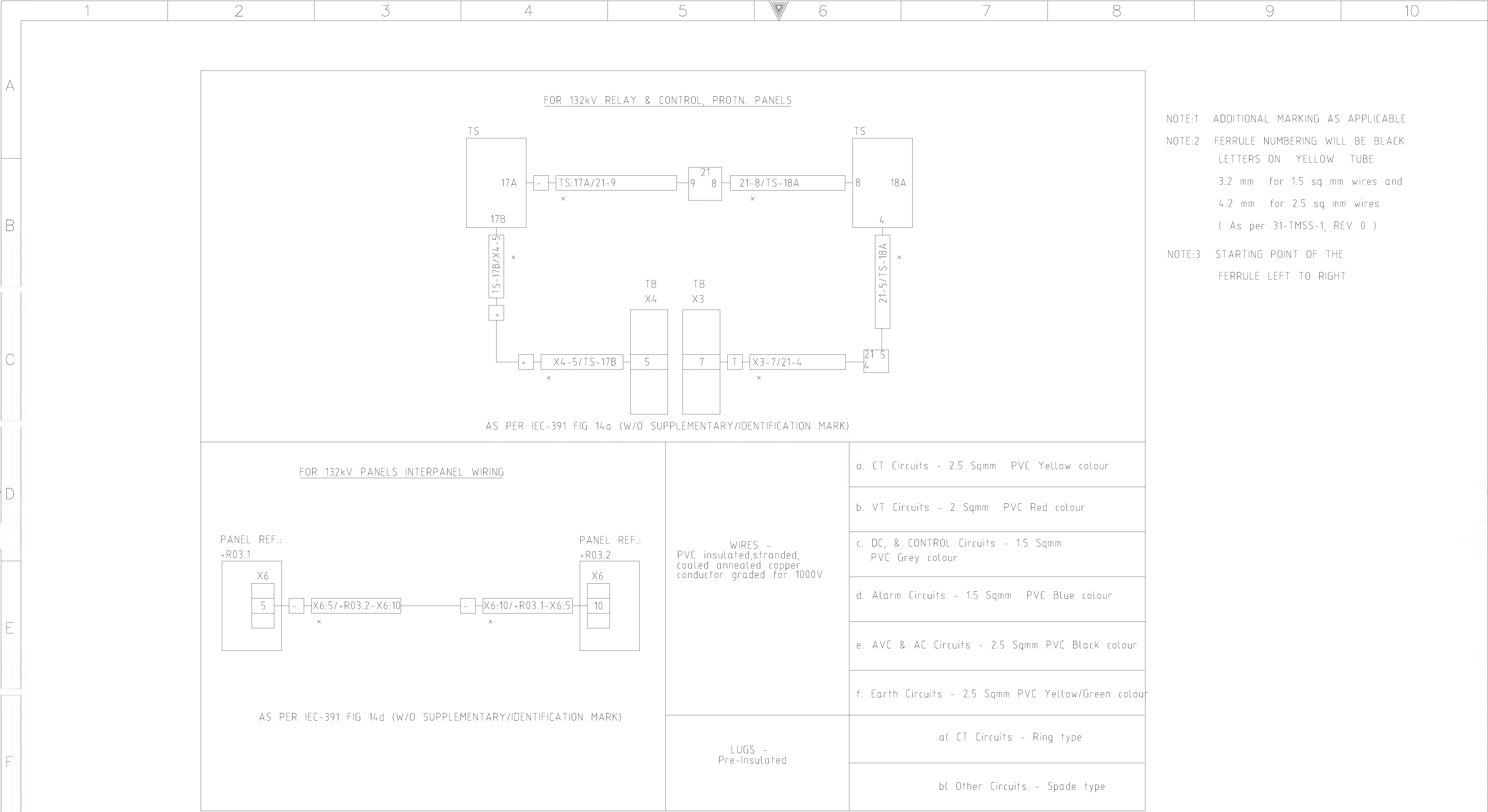
A. CT CIRCUITS- RING TYPE
B. OTHER CIRCUITS - SPADE TYPE

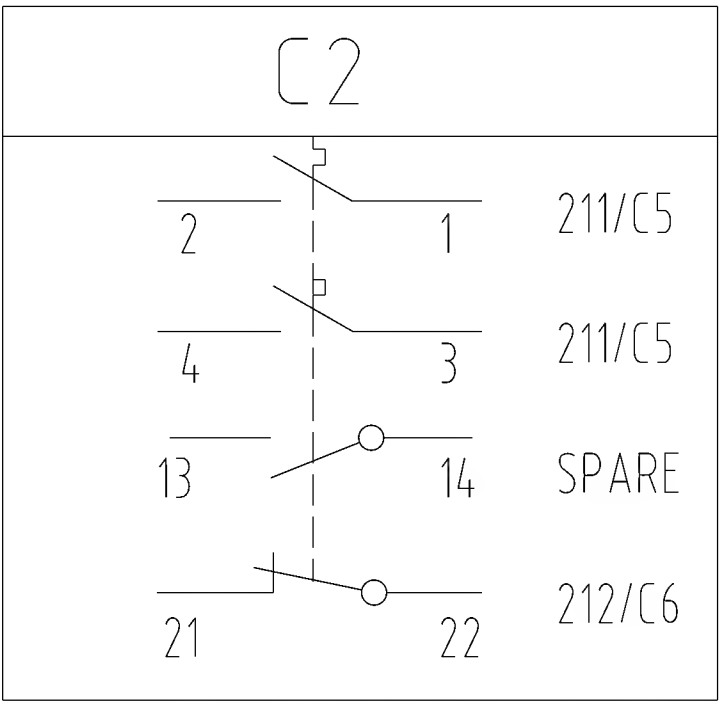
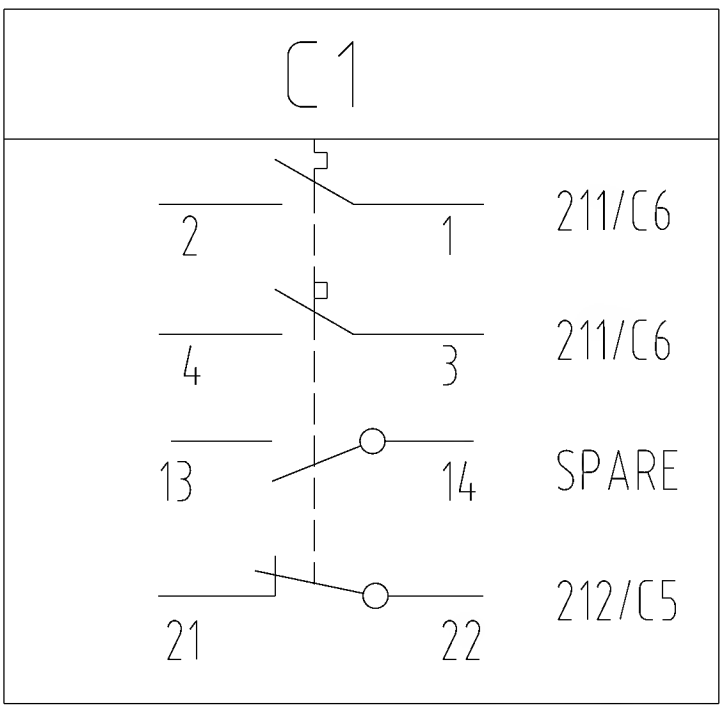
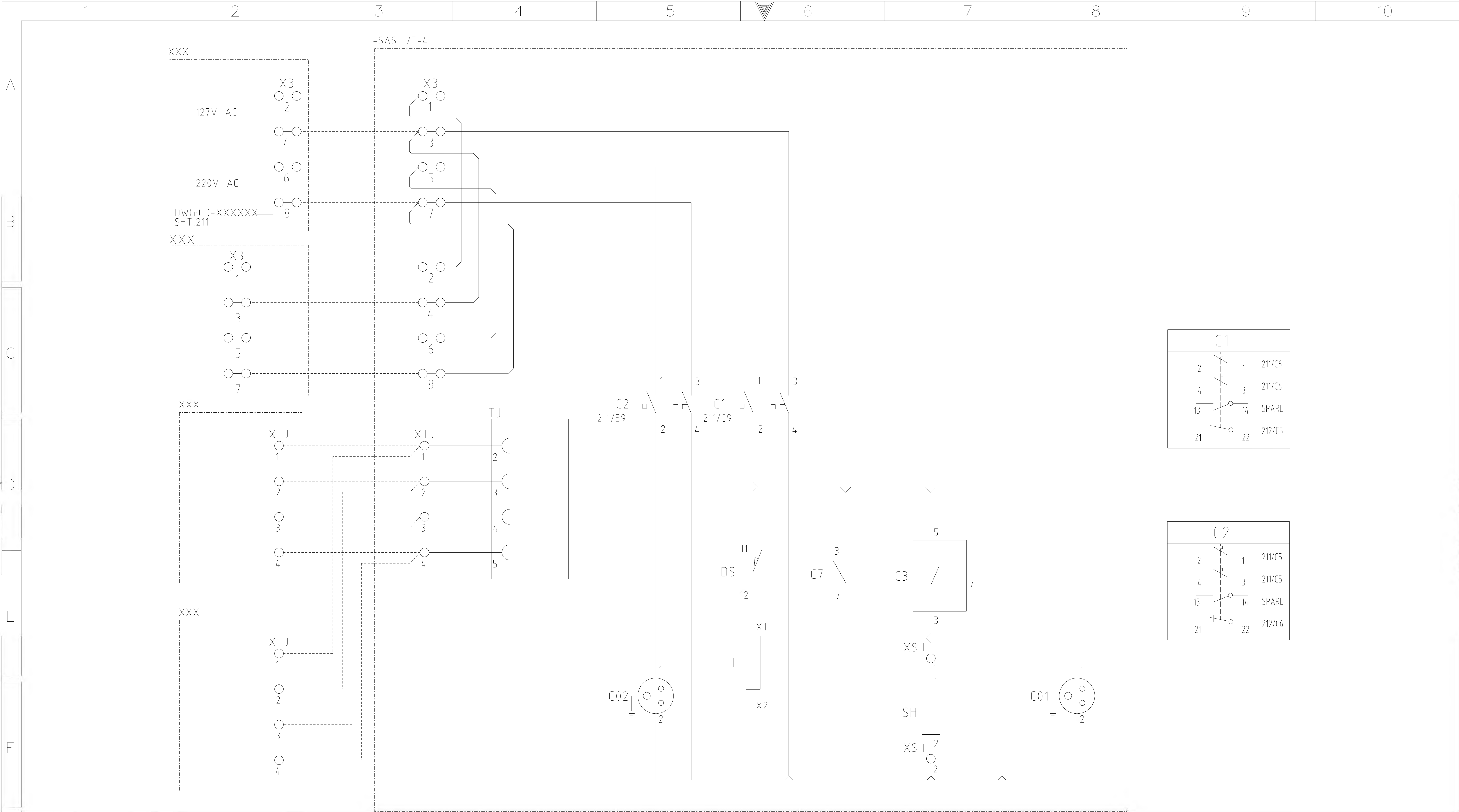
FERULLING


YELLO TUBE 3.2 mm FOR 1.5SQ mm WIRES AND 4.2 FOR 2.5 SQ mm WIRES (AS PER 31 - TMSS-1, RE.0)

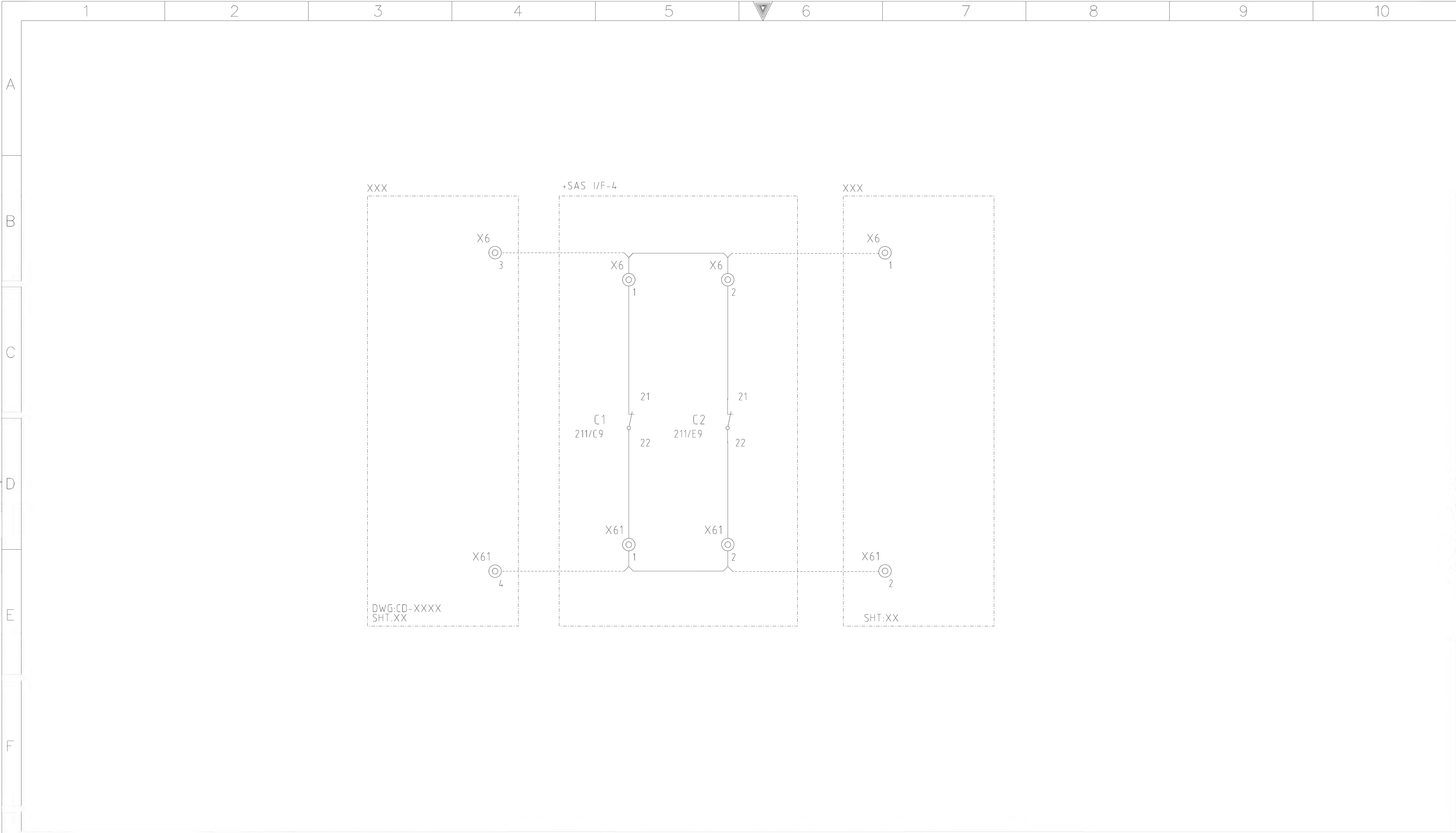
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMON LEGENDS				الشركة الوطنية لنقل الكهرباء				 نقل الكهرباء	
G			DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4											
	01	13 48	AS MANUFACTURED		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709 S-13656		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.	
	00	13 20	FOR APPROVAL		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH SAUDI ARABIA		P	C421	CD-323017		SHT	CONT.	01	
	REV. NO.	DATE	DESCRIPTION										013	014		



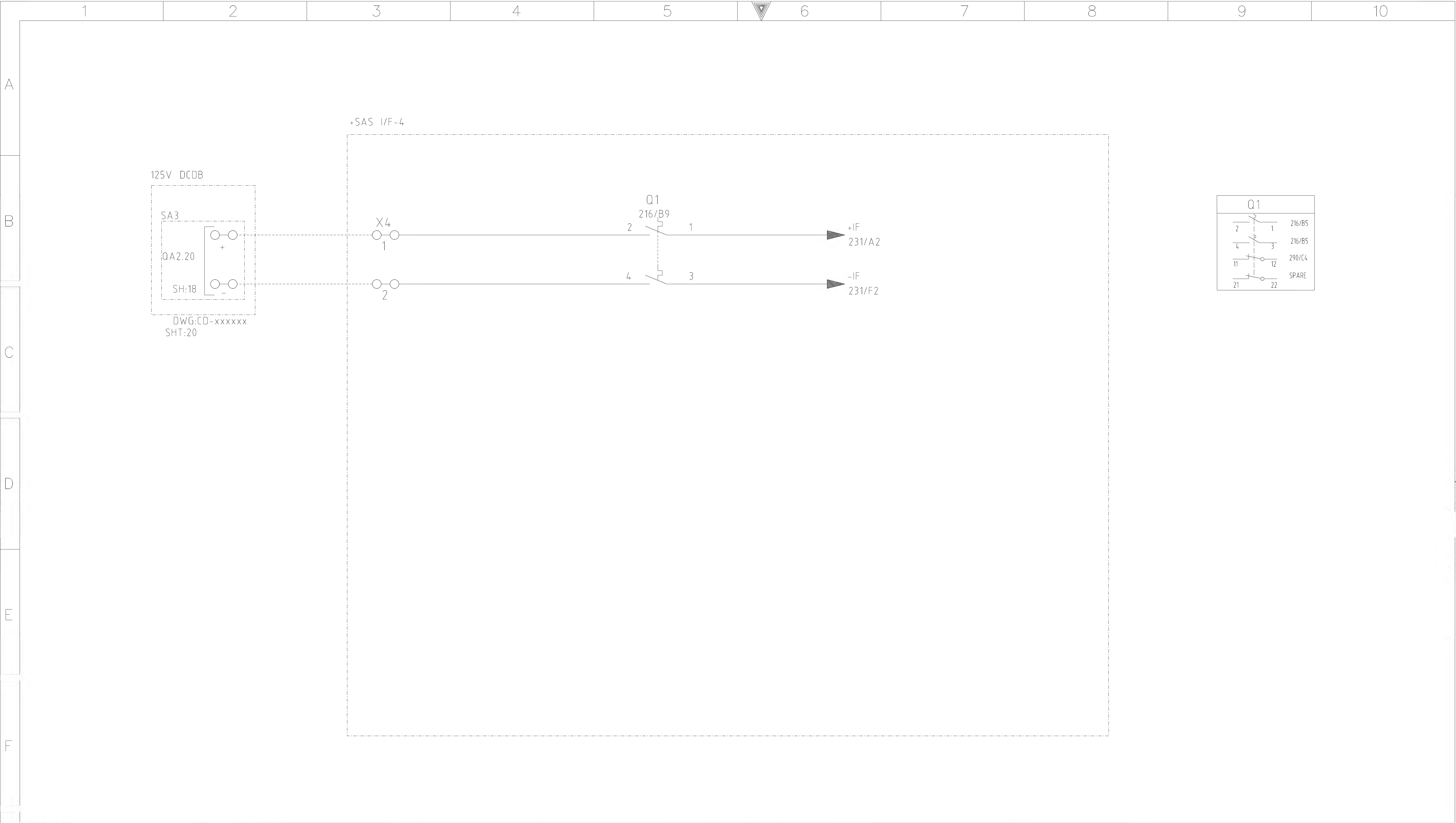




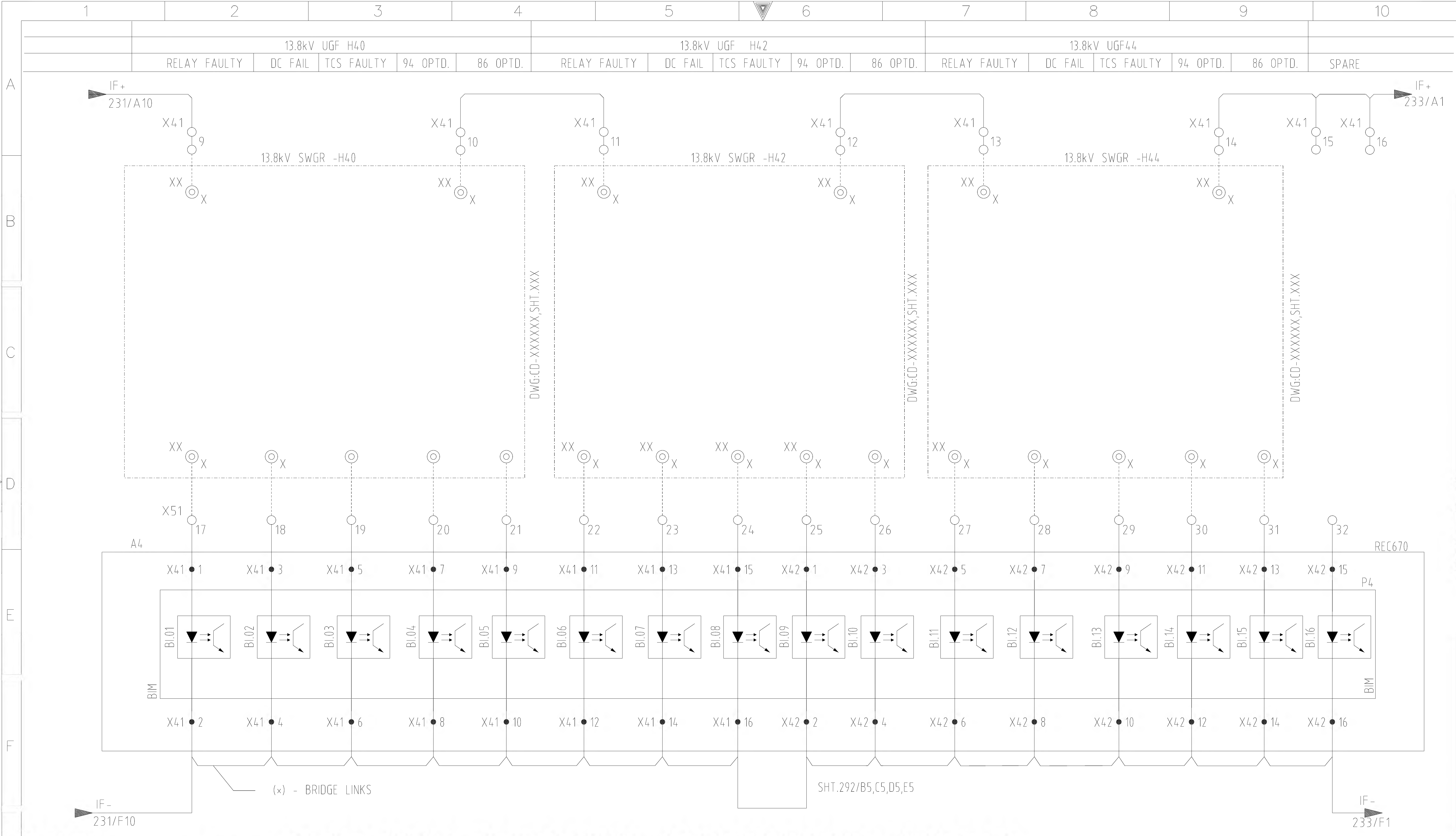
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		AC SUPPLY FOR ILLUMINATION & POWER SOCKET		الشركة الوطنية لنقل الكهرباء				 نقل الكهرباء					
					DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4		National Grid sa									
	01	13 48	AS MANUFACTURED		DATE STARTED 15.3.2013		S/S 8709		S-13656		INDEX		PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	00	13 20	FOR APPROVAL		DATE COMPLETED _____		S-13656				P		C421	CD-323017		SHT		CONT.
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH SAUDI ARABIA								211		212	



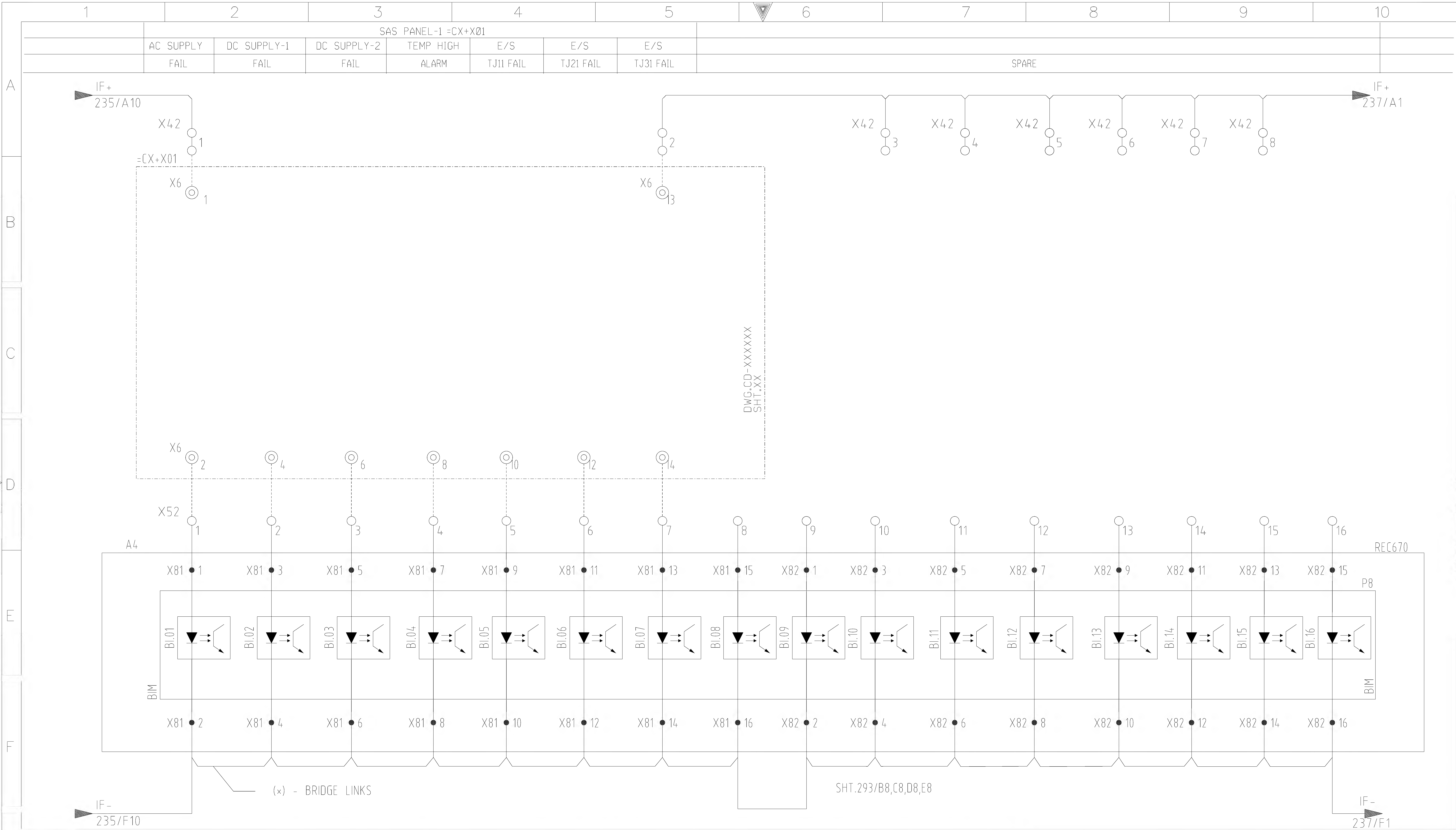
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		SUPPLY AUXILARY CONTACTS				<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>				
G			DRAWN BY _____ NSK _____ CHECKED BY _____ JKR _____		SAS INTERFACE PANEL +SAS I/F-4										
	01	13 48	AS MANUFACTURED		S/S 8709 S-13656										
	00	13 20	FOR APPROVAL		DATE STARTED 15.3.2013 DATE COMPLETED _____		S-13656		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC _____		RIYADH SAUDI ARABIA		P	C421	CD-323017		SHT	CONT.	01
													212	216	




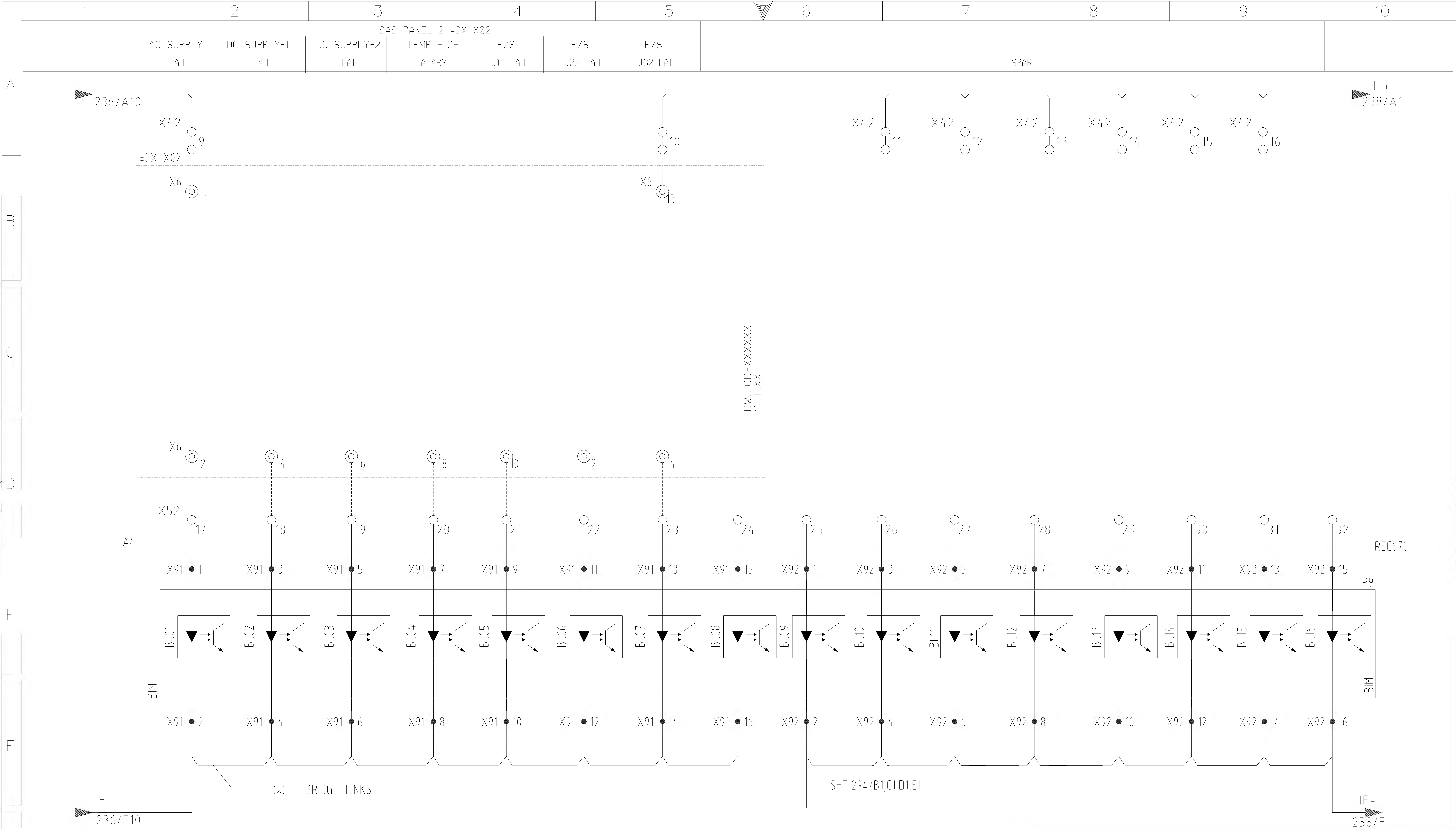
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		DC SUPPLY DISTRIBUTION				<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid SA</div>				
G			DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4										
	01	13 48	AS MANUFACTURED		S/S 8709 S-13656										
	00	13 20	FOR APPROVAL		DATE STARTED 15.3.2013 DATE COMPLETED _____		RIYADH SAUDI ARABIA		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC				P	C421	CD-323017		SHT	CONT.	01
													216	231	




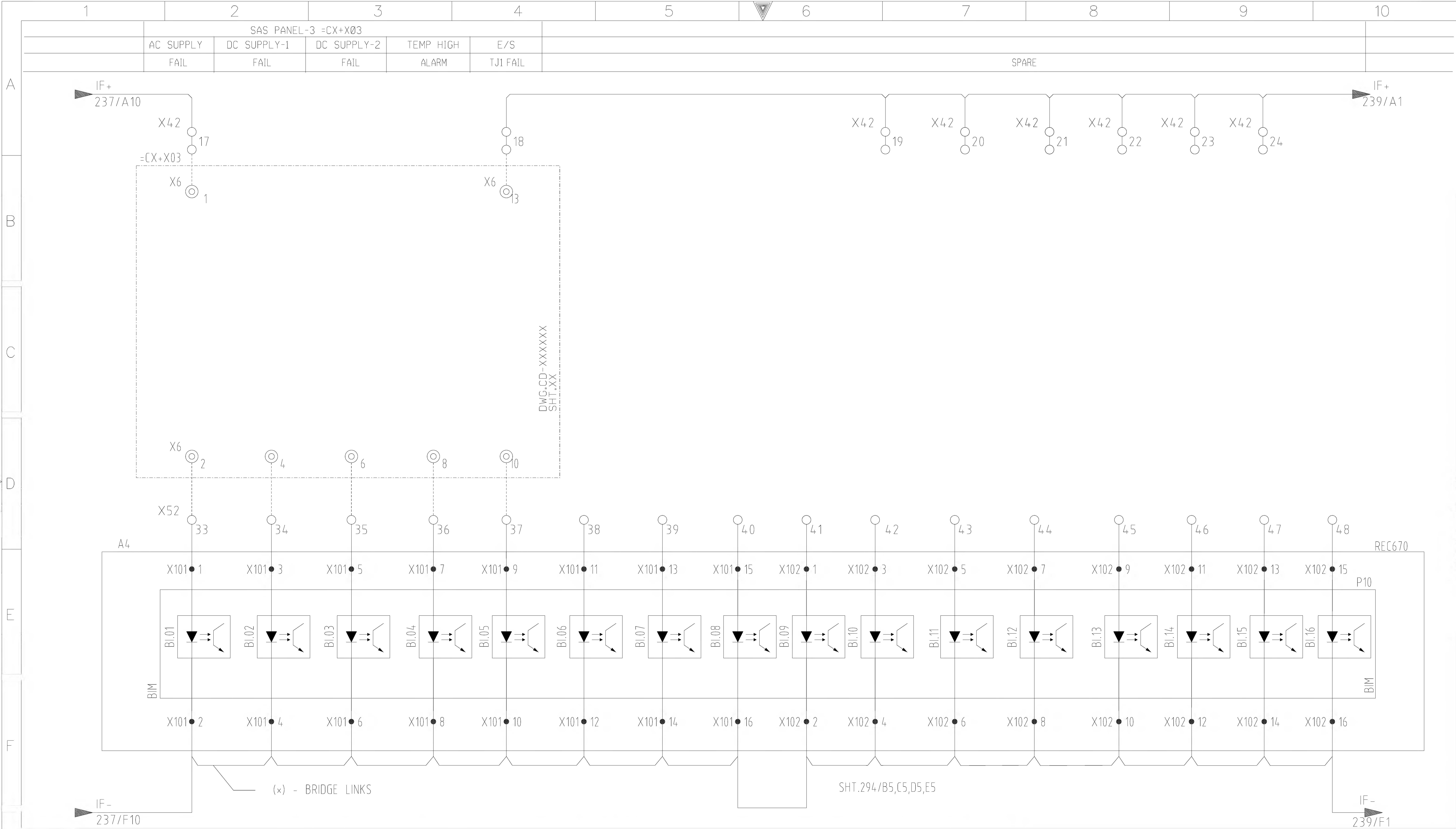
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		STATION INTERFACE PANEL BINARY INPUTS			<div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>								
			DRAWN BY _____ NSK _____ CHECKED BY _____ JKR				SAS INTERFACE PANEL +SAS I/F-4											
G	01	13 48	AS MANUFACTURED		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709			S-13656			INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
	00	13 20	FOR APPROVAL		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH			SAUDI ARABIA						SHT	CONT.	
	REV. NO.	DATE	DESCRIPTION								P	C421				CD-323017		



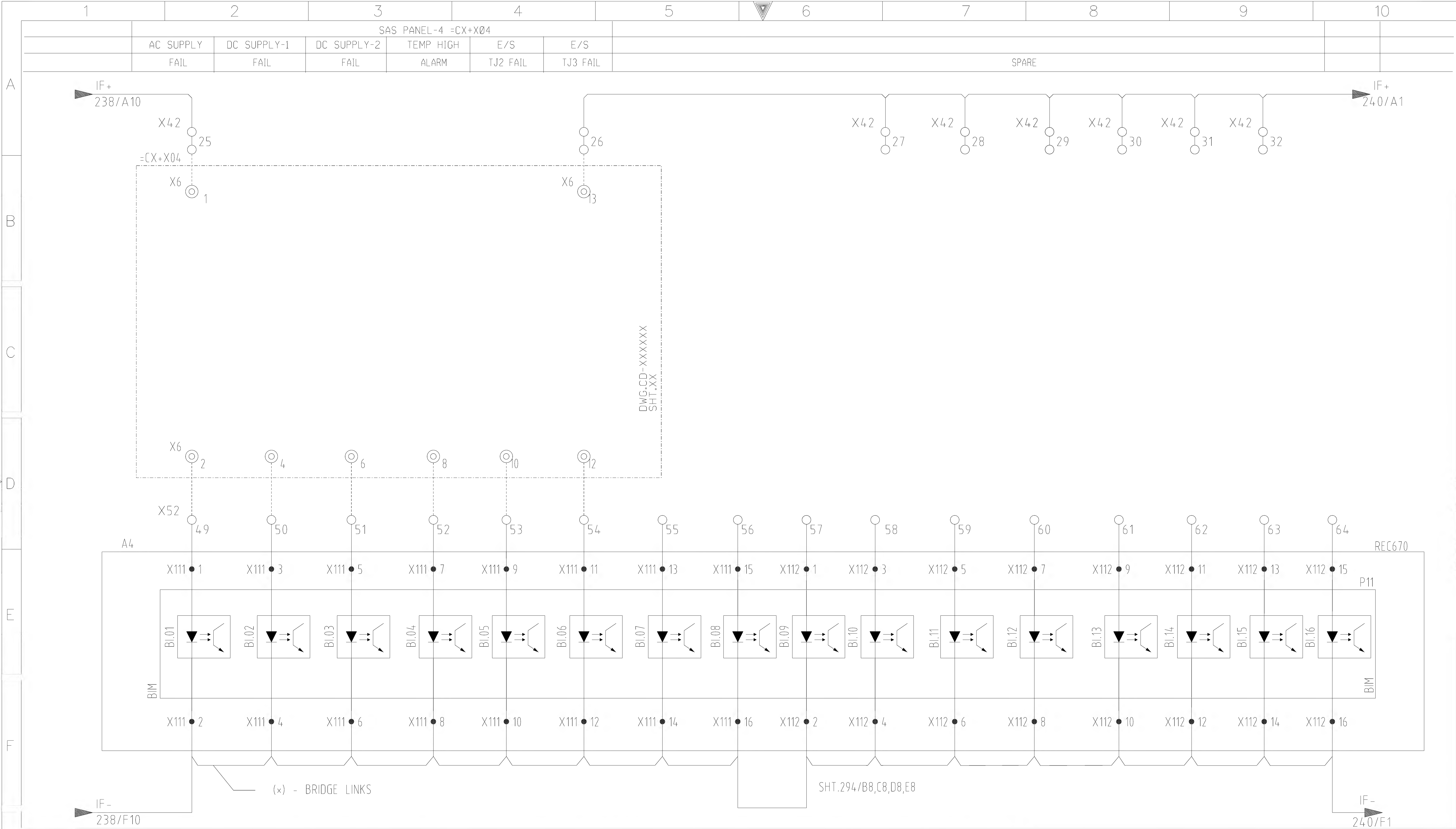
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		STATION INTERFACE PANEL BINARY INPUTS				الشركة الوطنية لنقل الكهرباء				 نقل الكهرباء	
					DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4				National Grid sa					
	01 13 48 AS MANUFACTURED				DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709 S-13656		INDEX PLANT NO. DRAWING NUMBER		SHEET NO.		REV. NO.			
	00 13 20 FOR APPROVAL				OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH SAUDI ARABIA		P C421 CD-323017		SHT CONT.		236 237 01			
	REV. NO.	DATE	DESCRIPTION													



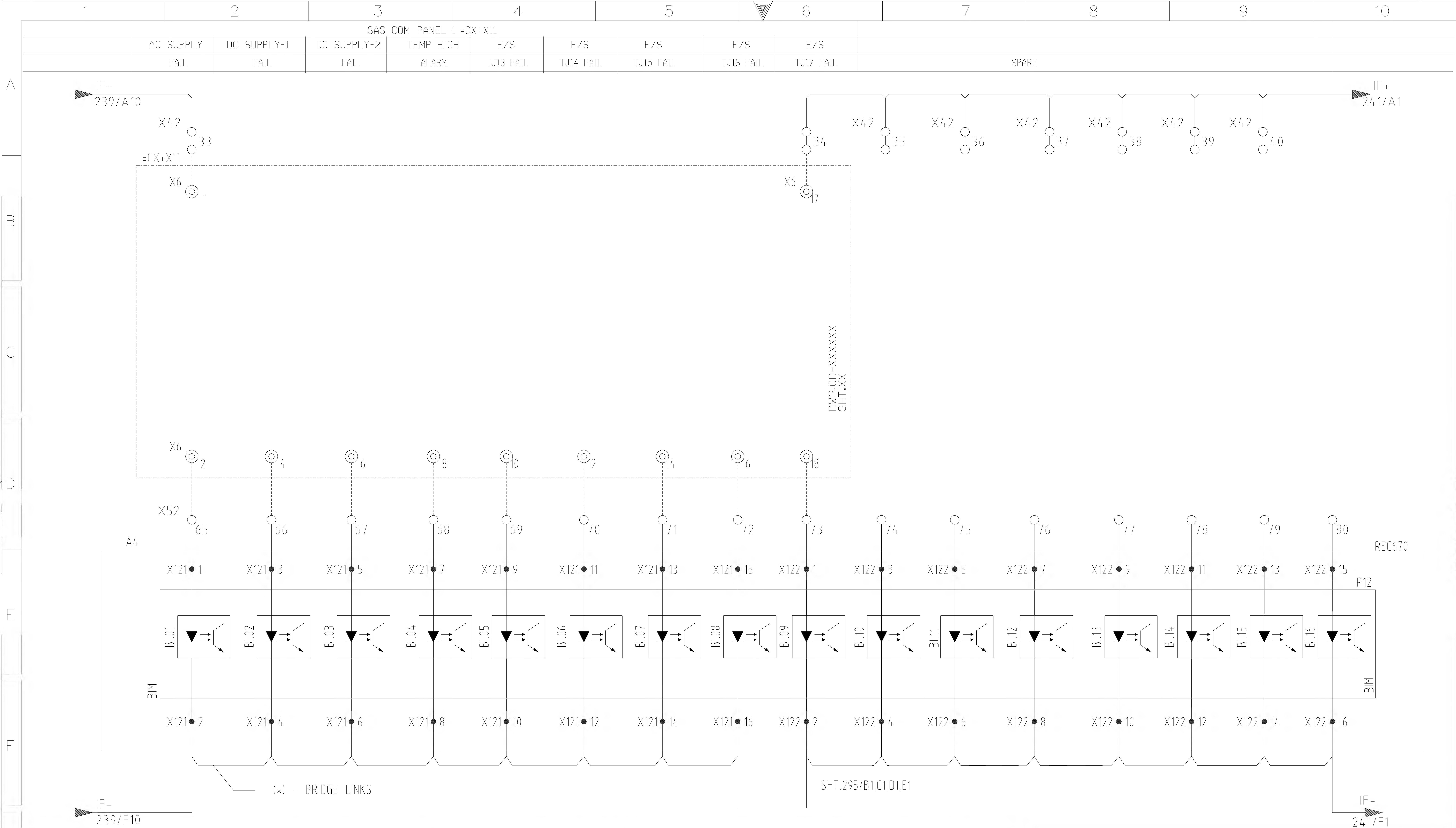
G	AS-BUILT BY _____		DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		STATION INTERFACE PANEL BINARY INPUTS				الشركة الوطنية لنقل الكهرباء						نقل الكهرباء									
					DRAWN BY _____		NSK		CHECKED BY _____		JKR		SAS INTERFACE PANEL +SAS I/F-4				National Grid sa											
	01		13 48		AS MANUFACTURED				DATE STARTED 15.3.2013		DATE COMPLETED _____		S/S 8709		S-13656		INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.			
	00		13 20		FOR APPROVAL				OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH		SAUDI ARABIA		P		C421		CD-323017		SHT 237		CONT. 238		01	
	REV. NO.		DATE		DESCRIPTION																							



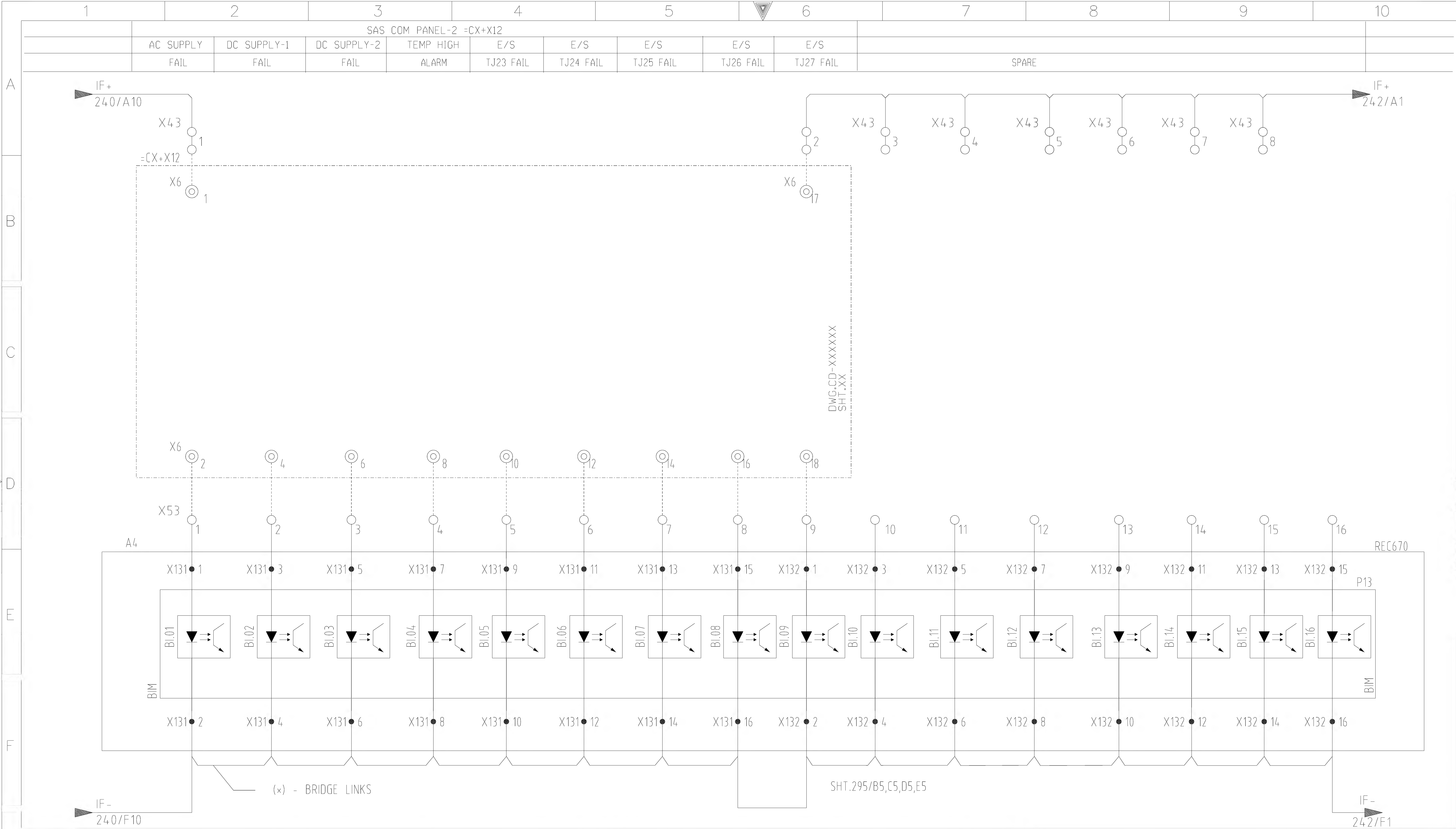
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		STATION INTERFACE PANEL BINARY INPUTS		<div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>						
				DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4									
	01	13 48	AS MANUFACTURED		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709 S-13656		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	00	13 20	FOR APPROVAL		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH SAUDI ARABIA		P	C421	CD-323017		SHT 238	CONT. 239	01
	REV. NO.	DATE	DESCRIPTION												




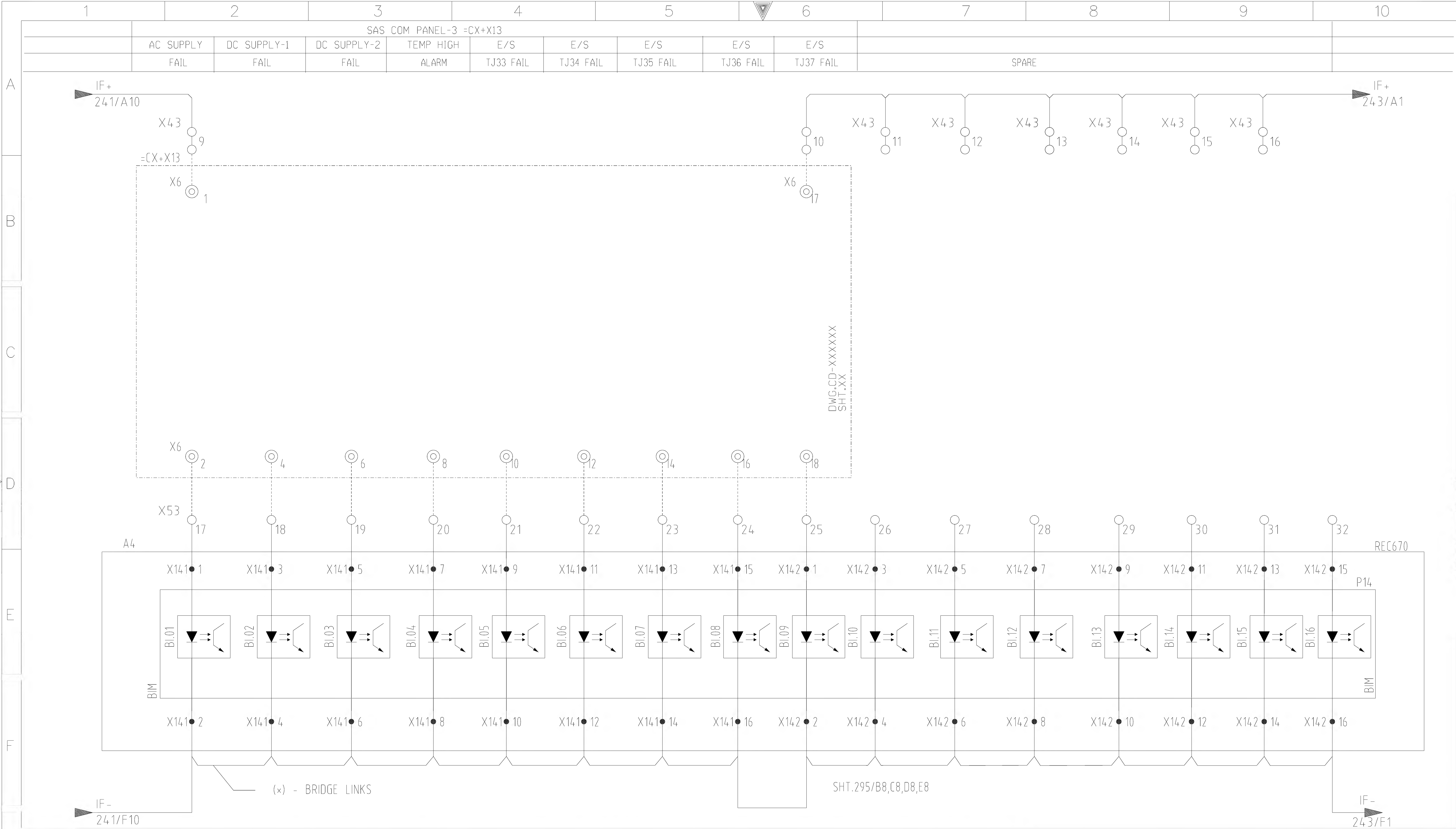
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							SAS INTERFACE PANEL +SAS I/F-4												
	01	13 48	AS MANUFACTURED		DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		S/S 8709				S-13656		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	00	13 20	FOR APPROVAL		DATE STARTED 15.3.2013 DATE COMPLETED _____		RIYADH				SAUDI ARABIA		P	C421	CD-323017		SHT CONT.		01
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC														




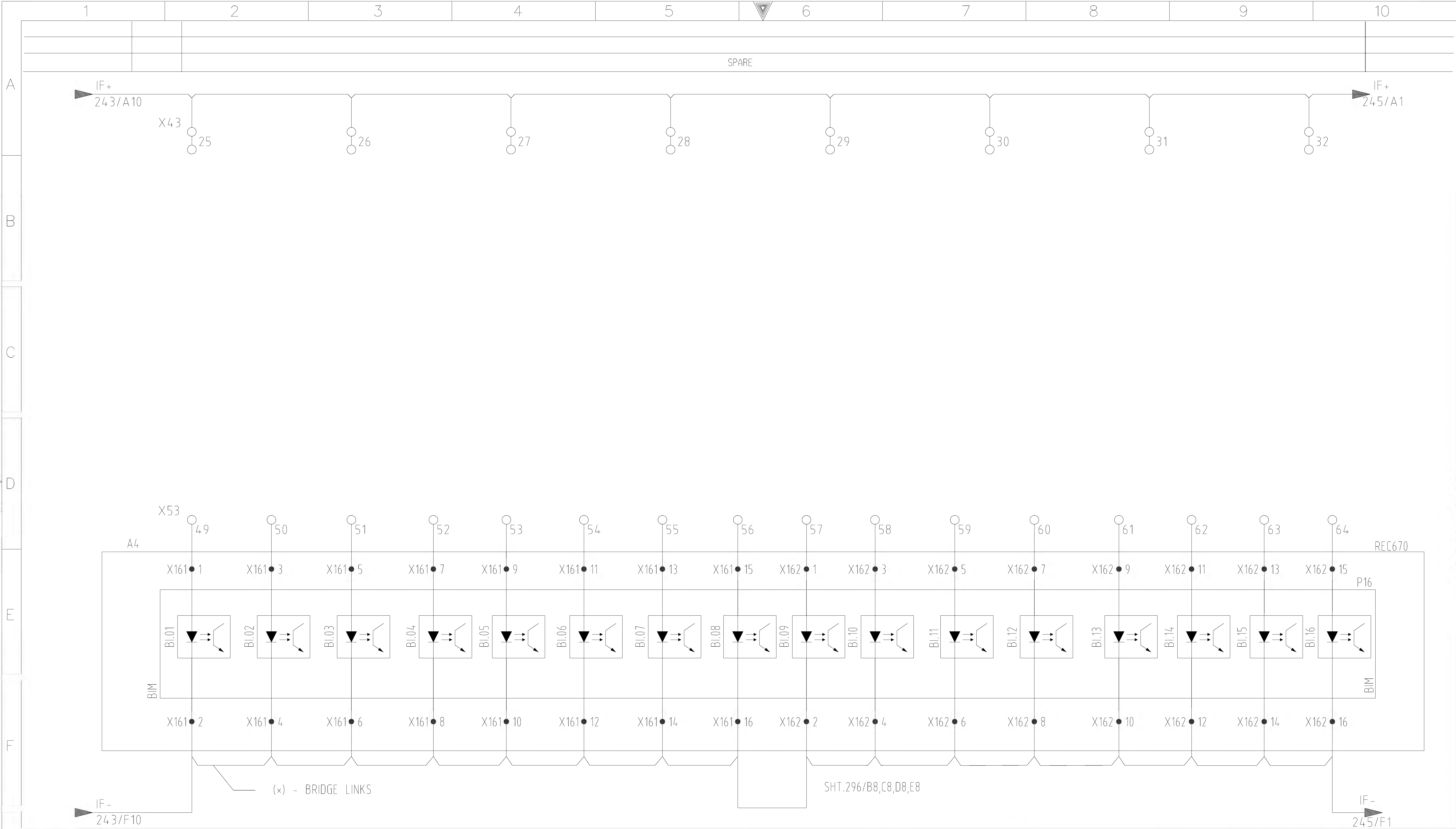
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					DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4										
	01	13 48	AS MANUFACTURED		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709		S-13656		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	00	13 20	FOR APPROVAL		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH		SAUDI ARABIA		P	C421	CD-323017		SHT CONT.		01
	REV. NO.	DATE	DESCRIPTION												240	241	



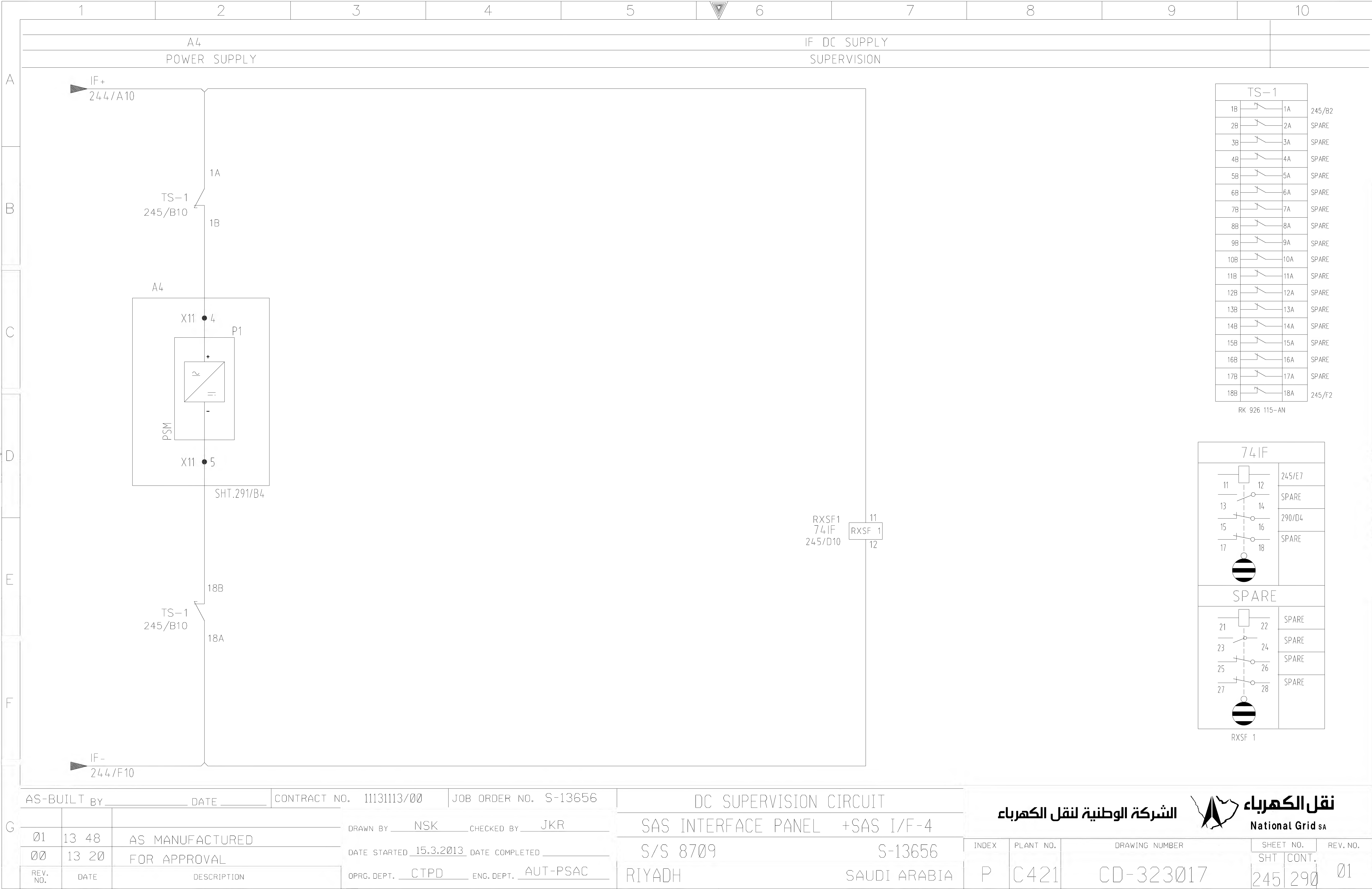
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					DRAWN BY _____		NSK		CHECKED BY _____		JKR		SAS INTERFACE PANEL +SAS I/F-4				National Grid sa										
	01		13 48		AS MANUFACTURED				DATE STARTED 15.3.2013		DATE COMPLETED _____		S/S 8709		S-13656		INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.		
	00		13 20		FOR APPROVAL												P		C421		CD-323017		SHT		CONT.		
	REV. NO.		DATE		DESCRIPTION		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH		SAUDI ARABIA										241		242		01



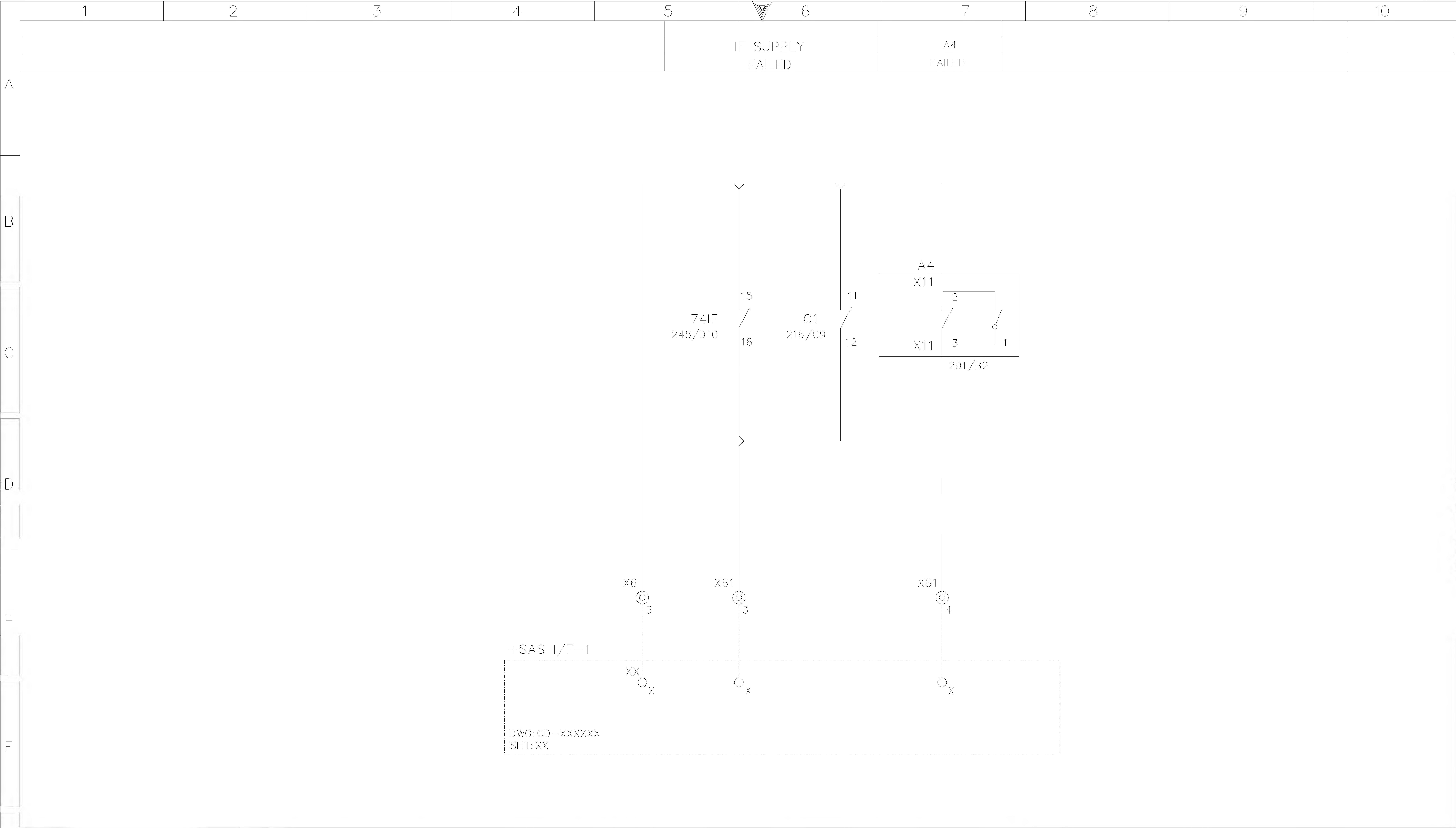
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			DRAWN BY _____ NSK _____ CHECKED BY _____ JKR				SAS INTERFACE PANEL +SAS I/F-4				National Grid sa					
	01	13 48	AS MANUFACTURED		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709		S-13656		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.	
	00	13 20	FOR APPROVAL		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH		SAUDI ARABIA		P	C421	CD-323017		SHT CONT.	
	REV. NO.	DATE	DESCRIPTION												REV. NO.	
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G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		STATION INTERFACE PANEL BINARY INPUTS				<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>									
	01	13 48	AS MANUFACTURED		DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4													
	00	13 20	FOR APPROVAL		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709 S-13656				INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.	
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH SAUDI ARABIA		P C421		CD-323017		SHT 244		CONT. 245		01			

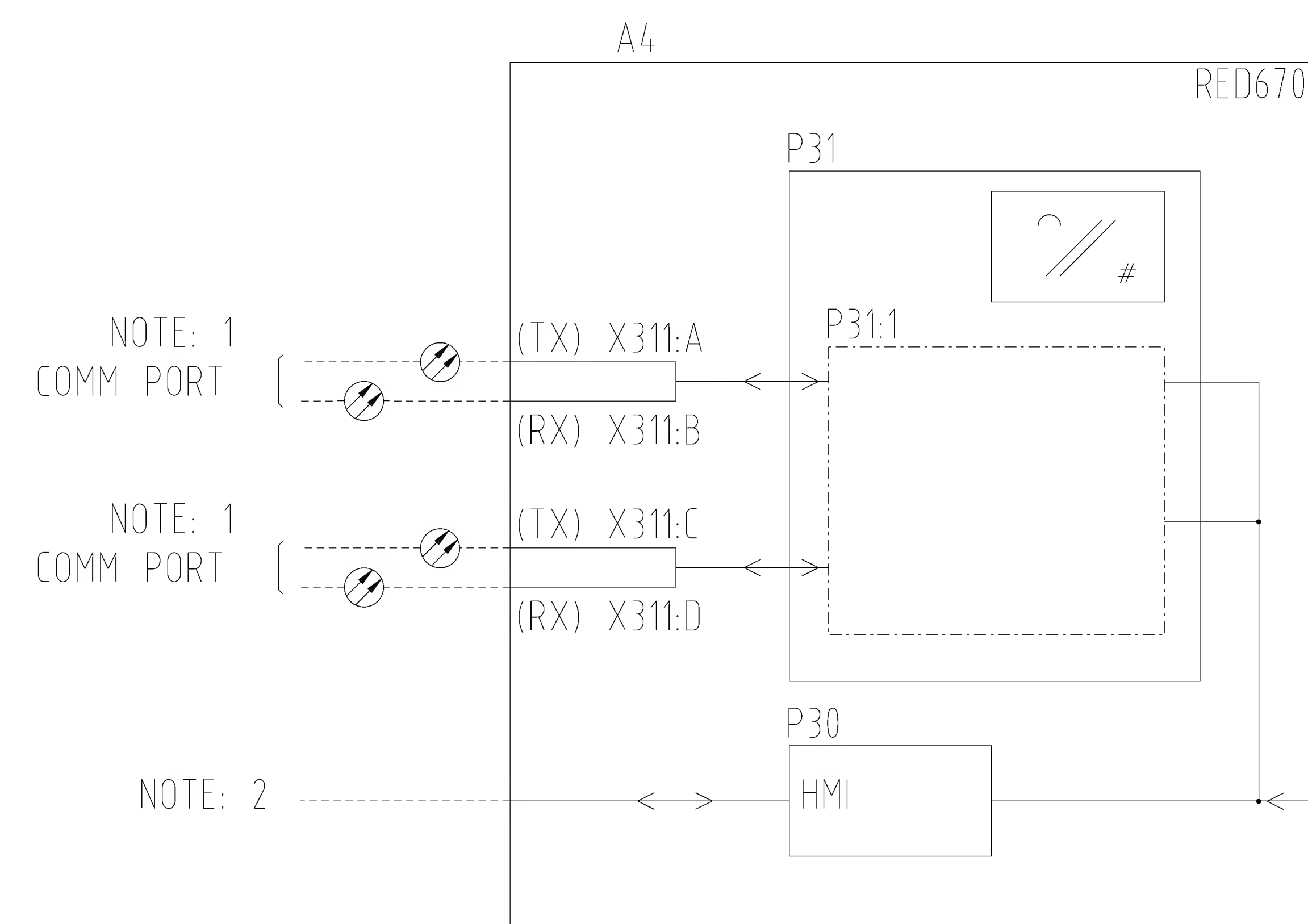
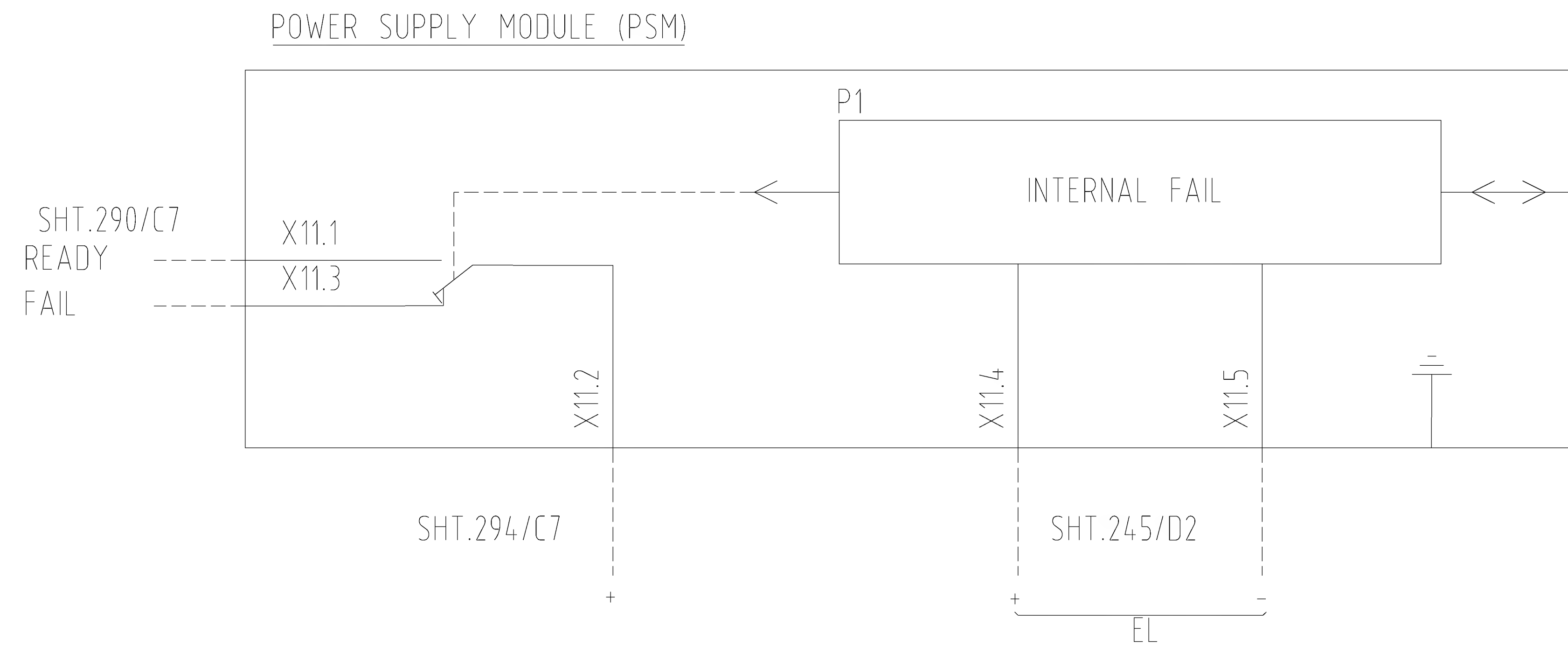


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AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMON ALARM CIRCUITS				<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>						
			DRAWN BY _____ NSK _____ CHECKED BY _____ JKR _____			SAS INTERFACE PANEL +SAS I/F-4											
01	13 48	AS MANUFACTURED		DATE STARTED 15.3.2013 DATE COMPLETED _____			S/S 8709		S-13656		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
00	13 20	FOR APPROVAL		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC _____			RIYADH		SAUDI ARABIA		P	C421	CD-323017		SHT 290 CONT. 291		01
REV. NO.	DATE	DESCRIPTION															

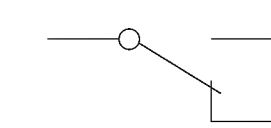


ABBREVIATIONS

TRM	TRANSFORMER INPUT MODULE
ADM	A/D CONVERSION MODULE
PSM	POWER SUPPLY MODULE
IOM	BINARY IN/OUT MODULE
BOM	BINARY OUTPUT MODULE
HMI	HUMAN MACHINE INTERFACE
BIM	BINARY INPUT MODULE

NOTE:

1. OPTICAL ETHERNET MODULE 2 GLASS INTERFACES - IEC 61850
2. FRONT COMMUNICATION PORT, ETHERNET, RJ45 CONNECTOR



USED FOR TRIP ISOLATION (RTXP-24)

USED FOR VOLTAGE (RTP-24)

USED FOR CT ISOLATION (RTXP-24)

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
01	13 48	AS MANUFACTURED		DRAWN BY <u>NSK</u> CHECKED BY <u>JKR</u>	
00	13 20	FOR APPROVAL		DATE STARTED <u>15.3.2013</u> DATE COMPLETED _____	
REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>	

BLOCK REFERENCE

SAS INTERFACE PANEL +SAS I/F-4

S/S 8709

S-13656

RIYADH

SAUDI ARABIA

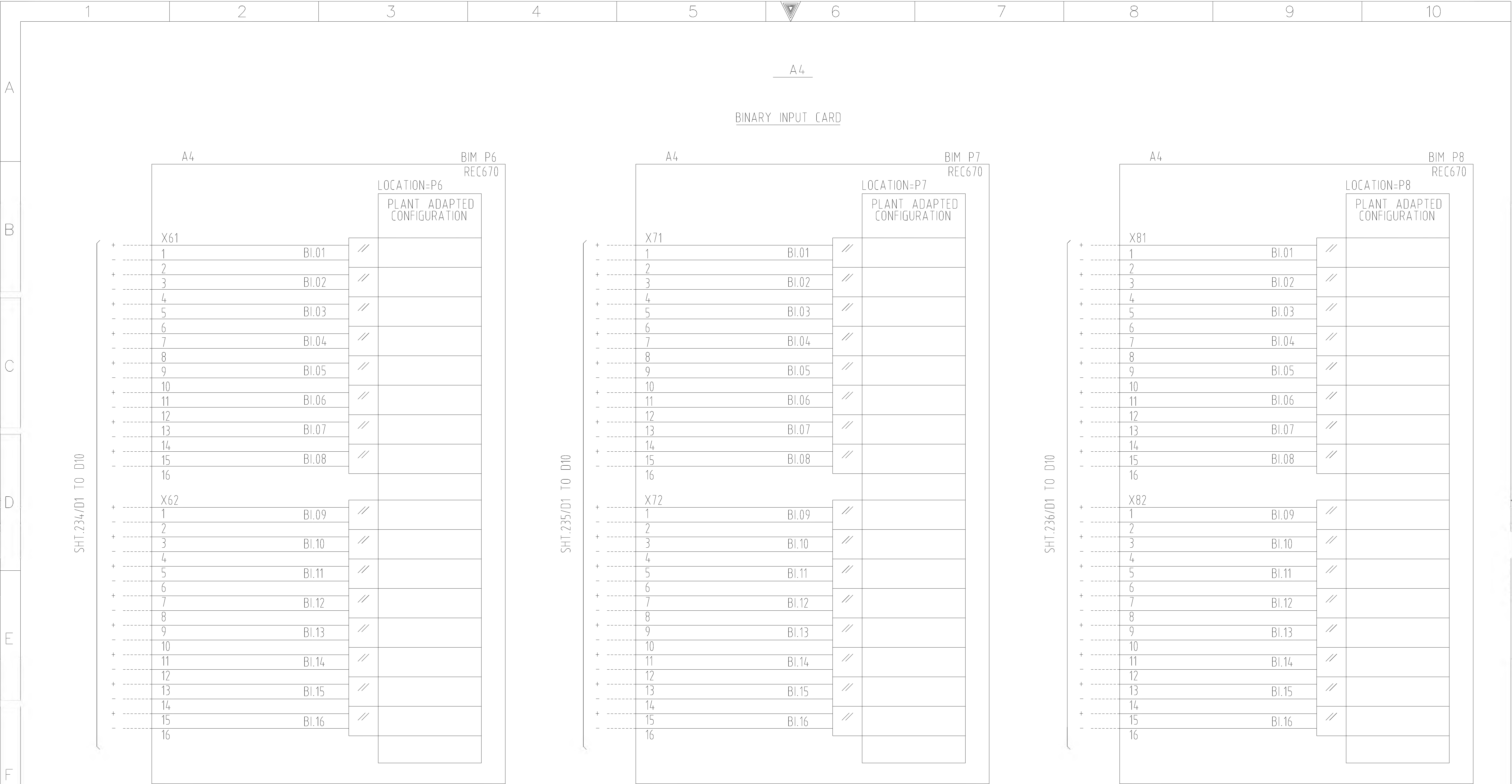
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P	C421	CD-323017	SHT	CONT.	01
			291	292	

NG/D2-D (2012/01)

DMS

VECTOR

NGD200



G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		BLOCK REFERENCE		الشركة الوطنية لنقل الكهرباء نقل الكهرباء National Grid SA						
			DRAWN BY _____ NSK _____ CHECKED BY _____ JKR		SAS INTERFACE PANEL +SAS I/F-4										
	01	13 48	AS MANUFACTURED		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709 S-13656		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	00	13 20	FOR APPROVAL		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC		RIYADH SAUDI ARABIA		P	C421	CD-323017		SHT	CONT.	01
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SHT.237/D1 TO D10

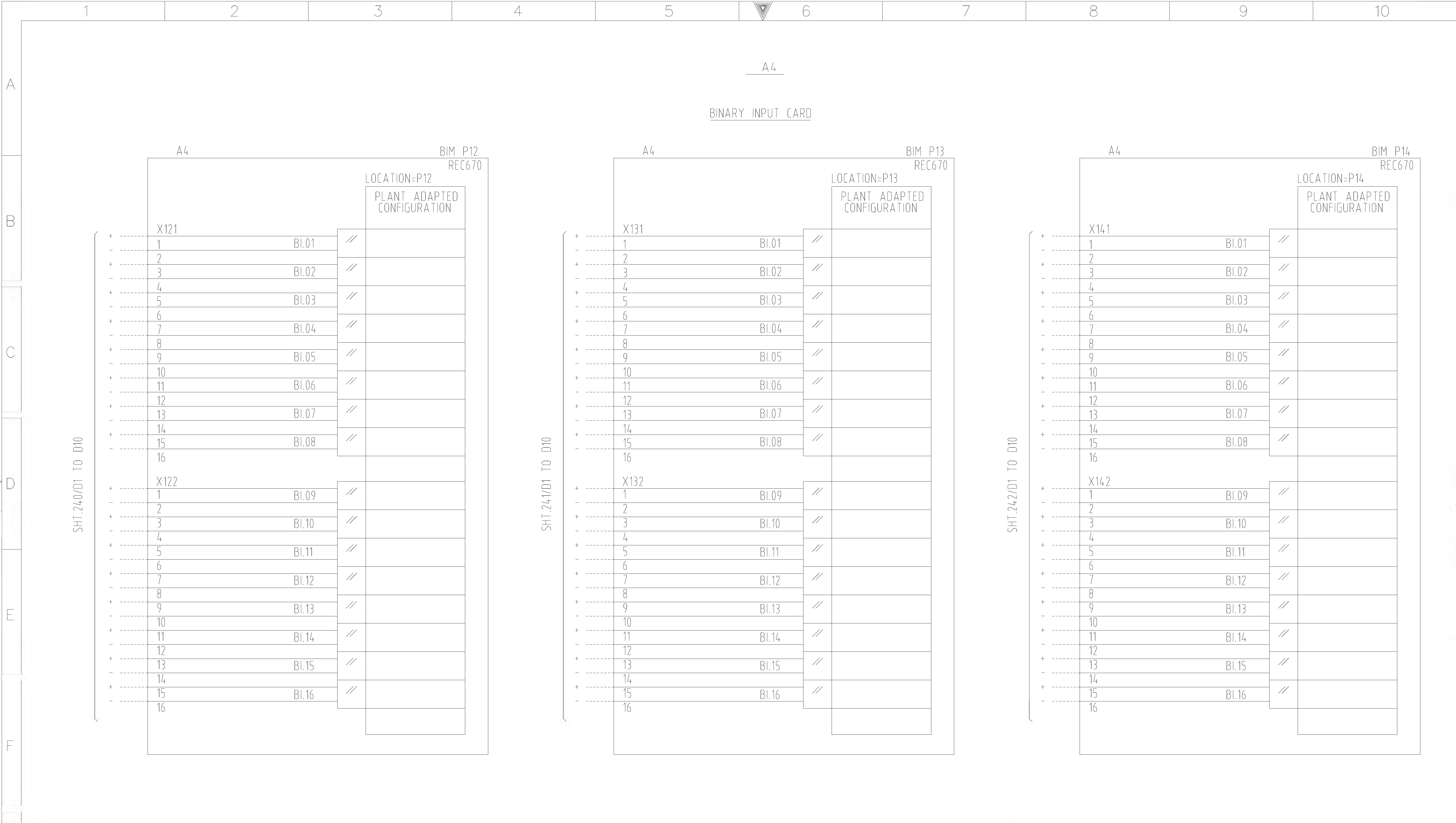
SHT.238/D1 TO D10

SHT.239/D1 TO D10

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AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		BLOCK REFERENCE			<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>		
01 13 48 AS MANUFACTURED			DRAWN BY NSK CHECKED BY JKR		SAS INTERFACE PANEL +SAS I/F-4							
00 13 20 FOR APPROVAL			DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709 S-13656							
REV. NO. DATE DESCRIPTION			OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		INDEX P	PLANT NO. C421	DRAWING NUMBER CD-323017		SHEET NO. SHT 294 CONT. 295	REV. NO. 01





AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

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FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY NSK

CHECKED BY JKR

DATE STARTED 15.3.2013

DATE COMPLETED _____

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC

BLOCK REFERENCE

SAS INTERFACE PANEL +SAS I/F-4

S/S 8709

S-13656

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

National Grid sa

INDEX

PLANT NO.

DRAWING NUMBER

SHEET NO.

SHT

CONT.

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DMS

VECTOR

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